Final Land Use Assumptions and Infrastructure Improvements Plan with Development Fee Report

Prepared for:
Tempe, Arizona

October 14, 2021

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EXECUTIVE SUMMARY

The City of Tempe, Arizona, contracted with TischlerBise to document land use assumptions, prepare the Infrastructure Improvements Plan (hereinafter referred to as the "IIP"), and update development fees pursuant to Arizona Revised Statutes ("ARS") § 9-436.05 (hereafter referred to as the "Enabling Legislation"). Municipalities in Arizona may assess development fees to offset infrastructure costs to a municipality for necessary public services. The development fees must be based on an Infrastructure Improvements Plan and Land Use Assumptions. The IIP for each type of infrastructure is in the middle section of this document. The proposed development fees are displayed in the Development Fee Report in the next section.

Development fees are one-time payments used to construct system improvements needed to accommodate new development. The fee represents future development's proportionate share of infrastructure costs. Development fees may be used for infrastructure improvements or debt service for growth related infrastructure. In contrast to general taxes, development fees may not be used for operations, maintenance, replacement, or correcting existing deficiencies. This update of Tempe's Infrastructure Improvements Plan and associated update to its development fees includes the following necessary public services:

1. Fire Facilities
2. Parks and Recreational Facilities
3. Police Facilities

This plan includes all necessary elements required to be in full compliance with SB 1525.

ARIZONA DEVELOPMENT FEE ENABLING LEGISLATION

The Enabling Legislation governs how development fees are calculated for municipalities in Arizona.

Necessary Public Services

Under the requirements of the Enabling Legislation, development fees may only be used for construction, acquisition or expansion of public facilities that are necessary public services. "Necessary public service" means any of the following categories of facilities that have a life expectancy of three or more years and that are owned and operated on behalf of the municipality: water, wastewater, storm water, library, street, fire, police, and parks and recreational. Additionally, a necessary public service includes any facility that was financed before June 1, 2011, and that meets the following requirements:

1. Development fees were pledged to repay debt service obligations related to the construction of the facility.
2. After August 1, 2014, any development fees collected are used solely for the payment of principal and interest on the portion of the bonds, notes, or other debt service obligations issued before June 1, 2011, to finance construction of the facility.

Infrastructure Improvements Plan

Development fees must be calculated pursuant to an IIP. For each necessary public service that is the subject of a development fee, by law, the IIP shall include the following seven elements:

1. A description of the existing necessary public services in the service area and the costs to update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable.
2. An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable.
3. A description of all or the parts of the necessary public services or facility expansions and their costs necessitated by and attributable to development in the service area based on the approved Land Use Assumptions, including a forecast of the costs of infrastructure, improvements, real property, financing, engineering and architectural services, which shall be prepared by qualified professionals licensed in this state, as applicable.
4. A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial, and industrial.
5. The total number of projected service units necessitated by and attributable to new development in the service area based on the approved Land Use Assumptions and calculated pursuant to generally accepted engineering and planning criteria.
6. The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years.
7. A forecast of revenues generated by new service units other than development fees, which shall include estimated state-shared revenue, highway users revenue, federal revenue, ad valorem property taxes, construction contracting or similar excise taxes and the capital recovery portion of utility fees attributable to development based on the approved Land Use Assumptions and a plan to include these contributions in determining the extent of the burden imposed by the development.

Qualified Professionals

The IIP must be developed by qualified professionals using generally accepted engineering and planning practices. A qualified professional is defined as "a professional engineer, surveyor, financial analyst or planner providing services within the scope of the person's license, education, or experience." TischlerBise is a fiscal, economic, and planning consulting firm specializing in the cost of growth services. Our services include development fees, fiscal impact analysis, infrastructure financing analyses, user fee/cost of service studies, capital improvement plans, and fiscal software. TischlerBise has prepared over 800 development fee studies over the past 30 years for local governments across the United States.

Conceptual Development Fee Calculation

In contrast to project-level improvements, development fees fund growth-related infrastructure that will benefit multiple development projects, or the entire service area (usually referred to as system improvements). The first step is to determine an appropriate demand indicator for the particular type of infrastructure. The demand indicator measures the number of service units for each unit of development. For example, an appropriate indicator of the demand for parks is population growth and the increase in population can be estimated from the average number of persons per housing unit. The second step in the development fee formula is to determine infrastructure improvement units per service unit, typically called level-of-service (LOS) standards. In keeping with the park example, a common LOS standard is improved park acres per thousand people. The third step in the development fee formula is the cost of various infrastructure units. To complete the park example, this part of the formula would establish a cost per acre for land acquisition and/ or park improvements.

Evaluation of Credits/Offsets

Regardless of the methodology, a consideration of credits/offsets is integral to the development of a legally defensible development fee. There are two types of credits/offsets that should be addressed in development fee studies and ordinances. The first is a revenue credit/offset due to possible double payment situations, which could occur when other revenues may contribute to the capital costs of infrastructure covered by the development fee. This type of credit/offset is integrated into the fee calculation, thus reducing the fee amount. The second is a site-specific credit or developer reimbursement for dedication of land or construction of system improvements. This type of credit is addressed in the administration and implementation of the development fee program. For ease of administration, TischlerBise normally recommends developer reimbursements for system improvements.

DEVELOPMENT FEE REPORT

METHODOLOGY

Development fees for the necessary public services made necessary by new development must be based on the same level of service (LOS) provided to existing development in the service area. There are three basic methodologies used to calculate development fees. They examine the past, present, and future status of infrastructure. The objective of evaluating these different methodologies is to determine the best measure of the demand created by new development for additional infrastructure capacity. Each methodology has advantages and disadvantages in a particular situation and can be used simultaneously for different cost components.

Reduced to its simplest terms, the process of calculating development fees involves two main steps: (1) determining the cost of development-related capital improvements and (2) allocating those costs equitably to various types of development. In practice, though, the calculation of development fees can become quite complicated because of the many variables involved in defining the relationship between development and the need for facilities within the designated service area. The following paragraphs discuss basic methodologies for calculating development fees and how those methodologies can be applied.

- **Cost Recovery** (past improvements) - The rationale for recoupment, often called cost recovery, is that new development is paying for its share of the useful life and remaining capacity of facilities already built, or land already purchased, from which new growth will benefit. This methodology is often used for utility systems that must provide adequate capacity before new development can take place.
- **Incremental Expansion** (concurrent improvements) - The incremental expansion methodology documents current LOS standards for each type of public facility, using both quantitative and qualitative measures. This approach assumes there are no existing infrastructure deficiencies or surplus capacity in infrastructure. New development is only paying its proportionate share for growth-related infrastructure. Revenue will be used to expand or provide additional facilities, as needed, to accommodate new development. An incremental expansion cost method is best suited for public facilities that will be expanded in regular increments to keep pace with development.
- **Plan-Based** (future improvements) - The plan-based methodology allocates costs for a specified set of improvements to a specified amount of development. Improvements are typically identified in a long-range facility plan and development potential is identified by a land use plan. There are two basic options for determining the cost per demand unit: (1) total cost of a public facility can be divided by total demand units (average cost), or (2) the growth-share of the public facility cost can be divided by the net increase in demand units over the planning timeframe (marginal cost).

DEVELOPMENT FEE COMPONENTS

Figure 1 summarizes service areas, methodologies, and infrastructure cost components for each necessary public service.

Figure 1: Proposed Development Fee Service Areas, Methodologies, and Cost Components

Necessary Public Service	Service Area	Cost Recovery	Incremental Expansion	Plan-Based	Cost Allocation
Fire	Tempe	N/A	Apparatus	Facilities, Development Fee Report	Population, Vehicle Trips
Parks and Recreational	Tempe	N/A	Improvements, Facilities, Multi-Use Paths	Pools, Development Fee Report	Population, Jobs
Police	Tempe	N/A	Facilities	Development Fee Report	Population, Vehicle Trips

Calculations throughout this report are based on an analysis conducted using Excel software. Most results are discussed in the report using two, three, and four decimal places, which represent rounded figures. However, the analysis itself uses figures carried to their ultimate decimal places; therefore, the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown, not in the analysis).

PROPOSED DEVELOPMENT FEES

Development fees for residential development will be assessed per dwelling unit, based on the size of unit. Nonresidential development fees will be assessed per 1,000 square feet of floor area, based on the development type. The proposed fees represent the maximum allowable fees. Tempe may adopt fees that are less than the amounts shown; however, a reduction in development fee revenue will necessitate an increase in other revenues, a decrease in planned capital improvements, and/or a decrease in Tempe's LOS standards. All costs in the Development Fee Report represent current dollars with no assumed inflation over time. If costs change significantly over time, development fees should be recalculated.

Figure 2: Proposed Development Fees (North Street Fee Service Area)

Residential Fees per Unit					
Square Feet of Living Space	Fire	Parks & Recreational	Police	Street[1]	Total
900 or less	$196	$1,141	$253	$192	$1,782
901 to 1,400	$323	$1,879	$416	$306	$2,924
1,401 to 1,900	$414	$2,405	$533	$386	$3,738
1,901 or more	$481	$2,797	$619	$454	$4,351

Nonresidential Fees per 1,000 Square Feet					
Development Type	Fire	Parks & Recreational	Police	Street[1]	Total
Industrial	$79	$218	$191	$215	$703
Commercial	$397	$313	$959	$1,078	$2,747
Office & Other Services	$155	$398	$375	$422	$1,350
Institutional	$205	$124	$495	$558	$1,382

1. Current Street Development Fee not updated in the 2021 Development Fee Study

Figure 3: Proposed Development Fees (South Street Fee Service Area)

Residential Fees per Unit					
Square Feet of Living Space	Fire	Parks & Recreational	Police	Street[1]	Total
900 or less	$196	$1,141	$253	$151	$1,741
901 to 1,400	$323	$1,879	$416	$241	$2,859
1,401 to 1,900	$414	$2,405	$533	$303	$3,655
1,901 or more	$481	$2,797	$619	$356	$4,253

Nonresidential Fees per 1,000 Square Feet					
Development Type	Fire	Parks & Recreational	Police	Street[1]	Total
Industrial	$79	$218	$191	$169	$657
Commercial	$397	$313	$959	$847	$2,516
Office & Other Services	$155	$398	$375	$331	$1,259
Institutional	$205	$124	$495	$438	$1,262

1. Current Street Development Fee not updated in the 2021 Development Fee Study

CURRENT DEVELOPMENT FEES

Current development fees for residential development are assessed per dwelling unit, based on the size of unit. Nonresidential development fees are assessed per 1,000 square feet of floor area, based on the type of development. Shown below are the current development fees for the North Street Fee Service Area in Figure 4 and for the South Street Fee Service Area in Figure 5.

Figure 4: Current Development Fees (North Street Fee Service Area)

Residential Fees per Unit					
Square Feet of Living Space	Fire	Parks & Recreational	Police	Street	Total
900 or less	$233	$412	$264	$192	$1,101
901 to 1,400	$383	$676	$433	$306	$1,798
1,401 to 1,900	$487	$859	$550	$386	$2,282
1,901 or more	$562	$991	$635	$454	$2,642

Nonresidential Fees per 1,000 Square Feet					
Development Type	Fire	Parks & Recreational	Police	Street	Total
Industrial	$124	$211	$95	$215	$645
Commercial	$148	$251	$706	$1,078	$2,183
Office & Other Services	$259	$438	$276	$422	$1,395
Institutional	$66	$113	$255	$558	$992

Figure 5: Current Development Fees (South Street Fee Service Area)

Residential Fees per Unit					
Square Feet of Living Space	Fire	Parks & Recreational	Police	Street	Total
900 or less	$233	$412	$264	$151	$1,060
901 to 1,400	$383	$676	$433	$241	$1,733
1,401 to 1,900	$487	$859	$550	$303	$2,199
1,901 or more	$562	$991	$635	$356	$2,544

Nonresidential Fees per 1,000 Square Feet					
Development Type	Fire	Parks & Recreational	Police	Street	Total
Industrial	$124	$211	$95	$169	$599
Commercial	$148	$251	$706	$847	$1,952
Office & Other Services	$259	$438	$276	$331	$1,304
Institutional	$66	$113	$255	$438	$872

Difference Between Proposed and Current Development Fees

The differences between the proposed and current development fees are displayed below in Figure 6 for the North Street Fee Service Area and Figure 7 for the South Street Fee Service Area.

Figure 6: Difference Between Proposed and Current Development Fees (North Street Fee Service Area)

Residential Fees per Unit					
Square Feet of Living Space	Fire	Parks & Recreational	Police	Street	Total
900 or less	($37)	$729	($11)	$0	$681
901 to 1,400	($60)	$1,203	($17)	$0	$1,126
1,401 to 1,900	($73)	$1,546	($17)	$0	$1,456
1,901 or more	($81)	$1,806	($16)	$0	$1,709

Nonresidential Fees per 1,000 Square Feet					
Development Type	Fire	Parks & Recreational	Police	Street	Total
Industrial	($45)	$7	$96	$0	$58
Commercial	$249	$62	$253	$0	$564
Office & Other Services	($104)	($40)	$99	$0	($45)
Institutional	$139	$11	$240	$0	$390

Figure 7: Difference Between Proposed and Current Development Fees (South Street Fee Service Area)

Residential Fees per Unit					
Square Feet of Living Space	Fire	Parks & Recreational	Police	Street	Total
900 or less	($37)	$729	($11)	$0	$681
901 to 1,400	($60)	$1,203	($17)	$0	$1,126
1,401 to 1,900	($73)	$1,546	($17)	$0	$1,456
1,901 or more	($81)	$1,806	($16)	$0	$1,709

Nonresidential Fees per 1,000 Square Feet					
Development Type	Fire	Parks & Recreational	Police	Street	Total
Industrial	($45)	$7	$96	$0	$58
Commercial	$249	$62	$253	$0	$564
Office & Other Services	($104)	($40)	$99	$0	($45)
Institutional	$139	$11	$240	$0	$390

FIRE FACILITIES IIP

ARS § 9-463.05 (T)(7)(f) defines the facilities and assets that can be included in the Fire Facilities IIP:

> *"fire and police facilities, including all appurtenances, equipment and vehicles. Fire and police facilities do not include a facility or portion of a facility that is used to replace services that were once provided elsewhere in the municipality, vehicles and equipment used to provide administrative services, helicopters or airplanes or a facility that is used for training firefighters or officers from more than one station or substation."*

The Fire Facilities IIP includes components for fire facilities, fire apparatus, and the cost of preparing the Fire Facilities IIP and related Development Fee Report. The incremental expansion methodology is used for fire apparatus. A plan-based methodology is used for fire facilities and the Development Fee Report.

Service Area

Tempe's Fire Department strives to provide a uniform response time within the city limits; therefore, there is a single service area for the Fire Facilities IIP.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Fire Facilities IIP and development fees allocate the cost of necessary public services between residential and nonresidential based on calls for service from FY 2018 through FY 2020. As shown below, residential development generates 65 percent of demand for fire services and nonresidential development generates the remaining 35 percent of demand.

Figure F1: Proportionate Share

Development Type	FY 2018	FY 2019	FY 2020	Total
Residential	9,232	9,726	11,479	65%
Nonresidential	5,386	5,914	4,826	35%
Total	14,618	15,640	16,305	100%

Source: Tempe Fire Department

The proportionate share of costs attributable to residential development will be allocated to population and then converted to an appropriate amount by type of housing unit, based on housing unit size. Since nonresidential calls for service were unavailable by specific nonresidential use (i.e., retail, office, industrial, etc.), TischlerBise recommends using average weekday vehicle trips as the best demand indicator for nonresidential demand for fire services. Trip generation rates are highest for commercial development, such as a shopping center, and lowest for industrial development. Office and institutional trip rates fall between the other two categories. This ranking of trip rates is consistent with the relative demand for fire protection from nonresidential development.

Ratio of Service Unit to Development Unit

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure F2 displays the demand indicators for residential and nonresidential land uses. For residential development, the table displays the number of persons per housing unit. For nonresidential development, the table displays the number of vehicle trips per thousand square feet of floor area.

Figure F2: Ratio of Service Unit to Development Unit

Residential Development	
Development Type	Persons per Housing Unit[1]
900 or less	1.02
901 to 1,400	1.68
1,401 to 1,900	2.15
1,901 or more	2.50

Nonresidential Development			
Development Type	AWVTE per 1,000 Sq Ft[1]	Trip Rate Adjustment	AWVT per 1,000 Sq Ft[1]
Industrial	4.96	50%	2.48
Commercial	37.75	33%	12.46
Office & Other Services	9.74	50%	4.87
Institutional	19.52	33%	6.44

1. See Land Use Assumptions

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Fire Facilities – Plan-Based

The City of Tempe has seven fire stations with a combined floor area of 64,378 square feet, and the City plans to construct additional fire facilities to serve future development. Tempe recently constructed Fire Station #7 with 10,700 square feet of floor area using a combination of development fees, cash, and general obligation bonds. Since this new fire station has excess capacity to serve future development, Tempe plans to recover growth-related costs through development fees. Shown below, 4,507 square feet represents the share of Fire Station #7's total floor area with no outstanding debt. For the calculation of Tempe's existing level of service, this analysis uses 58,185 square feet of existing fire facilities.

To allocate the proportionate share of demand for fire facilities to residential and nonresidential development, this analysis uses calls for service outlined in Figure F1. Tempe's existing level of service for residential development is 0.1991 square feet per person (58,185 square feet X 65 percent residential share / 191,033 persons). The nonresidential level of service is 0.0385 square feet per vehicle trip (58,185 square feet X 35 percent nonresidential share / 523,917 vehicle trips).

Figure F3: Fire Facilities Level of Service

Description	Square Feet
Fire Station #1	10,597
Fire Station #2	6,385
Fire Station #3	8,300
Fire Station #4	5,000
Fire Station #5	5,734
Fire Station #6	17,662
Fire Station #7[1]	4,507
Total	58,185

Level-of-Service (LOS) Standards	
Existing Square Feet	58,185
Residential	
Residential Share	65%
2021 Population	191,033
Square Feet per Person	0.1991
Nonresidential	
Nonresidential Share	35%
2021 Vehicle Trips	523,917
Square Feet per Vehicle Trip	0.0385

Source: Tempe Fire Department

1. Excludes square footage with outstanding debt

Growth-Related Demand

Over the next 20 years, Tempe's population is expected to increase by 44,481 persons and nonresidential vehicle trips are expected to increase by 151,031 trips. To maintain the existing levels of service, Tempe will need to construct approximately 14,665 square feet of fire facilities over the next 20 years.

Figure F4: Projected Demand for Fire Facilities

Type of Infrastructure	Level of Service	Demand Unit
Fire Facilities	0.1991 Square Feet	per Person
	0.0385 Square Feet	per Vehicle Trip

Demand for Fire Facilities					
Year	Population	Vehicle Trips	Square Feet		
			Residential	Nonresidential	Total
2021	191,033	523,917	38,034.0	20,151.0	58,185.0
2022	193,777	531,779	38,580.3	20,453.4	59,033.7
2023	196,521	539,641	39,126.6	20,755.8	59,882.4
2024	199,265	547,503	39,672.9	21,058.2	60,731.1
2025	202,009	555,365	40,219.2	21,360.6	61,579.8
2026	204,283	563,542	40,672.0	21,675.1	62,347.0
2027	206,557	571,719	41,124.7	21,989.6	63,114.3
2028	208,831	579,895	41,577.5	22,304.1	63,881.6
2029	211,105	588,072	42,030.3	22,618.5	64,648.8
2030	213,379	596,249	42,483.0	22,933.0	65,416.1
2031	215,831	604,172	42,971.2	23,237.8	66,209.0
2032	218,283	612,096	43,459.4	23,542.6	67,001.9
2033	220,735	620,020	43,947.5	23,847.3	67,794.8
2034	223,187	627,943	44,435.7	24,152.1	68,587.8
2035	225,638	635,867	44,923.8	24,456.8	69,380.7
2036	227,284	642,380	45,251.5	24,707.4	69,958.9
2037	228,930	648,894	45,579.2	24,957.9	70,537.1
2038	230,576	655,407	45,906.9	25,208.4	71,115.4
2039	232,222	661,921	46,234.6	25,458.9	71,693.6
2040	233,868	668,434	46,562.3	25,709.5	72,271.8
2041	235,514	674,948	46,890.1	25,960.0	72,850.0
20-Yr Increase	44,481	151,031	8,856.1	5,809.0	14,665.0

As outlined on the next page, Tempe plans to construct more than 14,665 square feet of fire facilities within the next 20 years. The analysis compares the existing level of service to the planned level of service to ensure existing and future development pay their proportionate share of planned fire facility costs.

Cost of Planned Fire Station Capacity

Tempe recently constructed Fire Station #7 with 10,700 square feet at a cost of $6,239,045. To date, Tempe has paid $2,628,127 in cash, development fees, and bond payments for this station. The remaining balance of $3,610,918 includes general obligation bonds issued in 2017, 2018, 2019, and 2020. The final bond payment related to the 2020 bond is due in 2041. Tempe plans to construct Fire Station #8 to serve future development. Based on cost estimates provided by Tempe's Fire Department, the station will cost $11,450,000 to construct 16,000 square feet.

As shown below, the total planned fire station cost is $15,060,918. Based on the existing LOS analysis shown in Figure F3 and the projected growth through 2041 (the final year of bond payments for Fire Station #7), the growth-related share of fire facilities cost is $9,952,302 ($15,060,918 planned fire station cost X 66 percent growth-related share). The analysis uses a similar calculation for the growth-related square feet. The planned capacity equals 22,193 square feet, and the growth-related share is 14,665 square feet. The remaining cost of $5,108,616 must be paid with non-development fee revenues. This represents existing development's share of costs.

Figure F5: Cost of Remaining and Future Fire Station Capacity

Cost of Planned Fire Station Capacity	
Fire Station #7 Cost - Total	$6,239,045
Fire Station #7 Cost - Paid[1]	($2,628,127)
Fire Station #7 Cost - Remaining	$3,610,918
Fire Station #8 Cost - Total	$11,450,000
Planned Fire Station Cost	$15,060,918
Growth-Related Share[2]	66%
Growth-Related Cost	$9,952,302

Planned Fire Station Capacity	
Fire Station #7 Square Feet - Total	10,700
Fire Station #7 Square Feet - Paid	(4,507)
Fire Station #7 Square Feet - Remaining	6,193
Fire Station #8 Square Feet - Total	16,000
Planned Square Feet	22,193
Growth-Related Share[2]	66%
Growth-Related Square Feet	14,665

1. Includes cash, development fee funds, and debt payments
2. TischlerBise calculation (14,665 sq ft / 22,193 sq ft)

Fire Facilities Cost Analysis

Based on a growth-related cost of $9,952,302 and 14,665 square feet, the analysis uses a cost of $679 per square foot. To allocate the proportionate share of demand for fire facilities to residential and nonresidential development, this analysis uses calls for service outlined in Figure F1. The growth-related level of service for residential development is 0.2155 square feet per person (14,665 square feet X 65 percent residential share / 44,481 additional persons). The nonresidential level of service is 0.0336 square feet per vehicle trip (14,665 square feet X 35 percent nonresidential share / 151,031 additional vehicle trips). For fire facilities, the cost is $146.25 per person (0.2155 square feet per person X $679 per square foot) and $22.82 per vehicle trip (0.0336 square feet per vehicle trip X $679 per square foot).

Figure F6: Fire Facilities Cost Analysis

Cost Factors	
Growth-Related Cost	$9,952,302
Growth-Related Square Feet	14,665
Cost per Square Foot	$679

Level-of-Service (LOS) Standards	
Growth-Related Square Feet	14,665
Residential	
Residential Share	65%
20-Year Population Increase	44,481
Square Feet per Person	0.2155
Cost per Person	$146.25
Nonresidential	
Nonresidential Share	35%
20-Year Vehicle Trip Increase	151,031
Square Feet per Vehicle Trip	0.0336
Cost per Vehicle Trip	$22.82

Fire Bonds – Credit

Tempe issued general obligation bonds in 2017, 2018, 2019, and 2020 to construct Fire Station #7. This analysis includes a credit for future principal payments on outstanding debt. A credit is necessary since future development will pay the development fee and will also contribute to future principal payments on this remaining debt. A credit is not necessary for interest payments because interest costs are not included in the development fee.

As shown in Figure F7, outstanding debt related to Fire Station #7 will be repaid over the next 20 years. The original principal balance was $3,651,321, and the remaining principal balance equals $3,610,918. Annual principal payments are divided by projected development to determine the credit per person or vehicle trip. To account for the time value of money, annual payments per person and vehicle trip are discounted using a net present value formula based on a discount rate of 3.4 percent. The net present value of future principal payments is $7.70 per person and $1.46 per vehicle trip.

Figure F7: Credit for Future Principal Payments

Year	Principal[1]	Residential Share (65%)	Population	Per Person	Nonresidential Share (35%)	Vehicle Trips	Per Vehicle Trip
2021	$177,591	$116,087	191,033	$0.61	$61,505	523,917	$0.12
2022	$116,857	$76,386	193,777	$0.39	$40,471	531,779	$0.08
2023	$139,888	$91,441	196,521	$0.47	$48,447	539,641	$0.09
2024	$137,648	$89,977	199,265	$0.45	$47,671	547,503	$0.09
2025	$138,003	$90,209	202,009	$0.45	$47,794	555,365	$0.09
2026	$144,925	$94,733	204,283	$0.46	$50,191	563,542	$0.09
2027	$152,457	$99,657	206,557	$0.48	$52,800	571,719	$0.09
2028	$158,920	$103,882	208,831	$0.50	$55,038	579,895	$0.09
2029	$166,453	$108,806	211,105	$0.52	$57,647	588,072	$0.10
2030	$169,786	$110,985	213,379	$0.52	$58,801	596,249	$0.10
2031	$176,249	$115,210	215,831	$0.53	$61,040	604,172	$0.10
2032	$183,171	$119,734	218,283	$0.55	$63,437	612,096	$0.10
2033	$196,708	$128,583	220,735	$0.58	$68,125	620,020	$0.11
2034	$204,241	$133,507	223,187	$0.60	$70,734	627,943	$0.11
2035	$213,426	$139,511	225,638	$0.62	$73,915	635,867	$0.12
2036	$225,159	$147,180	227,284	$0.65	$77,979	642,380	$0.12
2037	$234,955	$153,584	228,930	$0.67	$81,371	648,894	$0.13
2038	$248,340	$162,333	230,576	$0.70	$86,007	655,407	$0.13
2039	$240,661	$157,314	232,222	$0.68	$83,347	661,921	$0.13
2040	$165,931	$108,465	233,868	$0.46	$57,466	668,434	$0.09
2041	$19,547	$12,777	235,514	$0.05	$6,769	674,948	$0.01
Total	$3,610,918			$10.94			$2.07

Discount Rate	3.4%
Net Present Value	$7.70

Discount Rate	3.4%
Net Present Value	$1.46

1. Fire Station #7 share of 2017, 2018, 2019, and 2020 General Obligation Bonds

Fire Apparatus – Incremental Expansion

The City of Tempe has 20 fire apparatus with a total cost of $15,480,000, and the City plans to acquire additional fire apparatus to serve future development. To allocate the proportionate share of demand for fire apparatus to residential and nonresidential development, this analysis uses calls for service outlined in Figure F1. Tempe's existing level of service for residential development is 0.00007 units per person (20 units X 65 percent residential share / 191,033 persons). The nonresidential level of service is 0.00001 units per vehicle trip (20 units X 35 percent nonresidential share / 523,917 vehicle trips).

Based on the total cost of Tempe's existing fire apparatus, the weighted average cost for a new fire apparatus is $774,000 per unit ($15,480,000 total cost / 20 units). Tempe may use development fees to acquire additional fire apparatus similar to its existing inventory. For fire apparatus, the cost is $52.97 per person (0.00007 units per person X $774,000 per unit) and $10.23 per vehicle trip (0.00001 units per vehicle trip X $774,000 per unit).

Figure F8: Fire Apparatus Level of Service

Description	Units	Unit Cost	Total Cost
Engines	8	$830,000	$6,640,000
Aerial Ladder	2	$1,450,000	$2,900,000
Hazardous Materials Truck	2	$850,000	$1,700,000
Heavy Rescue	1	$1,100,000	$1,100,000
Ladder Tender 2	2	$850,000	$1,700,000
Light & Air Support Truck	1	$510,000	$510,000
Technical Rescue Support	1	$650,000	$650,000
Command Vehicle	1	$95,000	$95,000
Low Acuity Unit	1	$115,000	$115,000
Fire Medical Rescue Boat	1	$70,000	$70,000
Total	20	$774,000	$15,480,000

Cost Factors	
Weighted Average per Apparatus	$774,000

Level-of-Service (LOS) Standards	
Existing Apparatus	20
Residential	
Residential Share	65%
2021 Population	191,033
Units per Person	0.00007
Cost per Person	$52.97
Nonresidential	
Nonresidential Share	35%
2021 Vehicle Trips	523,917
Units per Vehicle Trip	0.00001
Cost per Vehicle Trip	$10.23

Source: Tempe Fire Department

Development Fee Report – Plan-Based

The cost to prepare the Fire Facilities IIP and related Development Fee Report totals $20,000. Tempe plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of future development from the *Land Use Assumptions* document, the cost is $0.82 per person and $0.23 per vehicle trip.

Figure F9: IIP and Development Fee Report

Necessary Public Service	Cost	Proportionate Share		Service Unit	5-Year Change	Cost per Service Unit
Fire	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Parks and Recreational	$23,370	Residential	89%	Population	13,250	$1.56
		Nonresidential	11%	Jobs	15,288	$0.17
Police	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Total	$63,370					

Projected Demand for Services and Costs

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

As shown in the *Land Use Assumptions* document, Tempe's population is expected to increase by 24,798 persons and nonresidential vehicle trips are expected to increase by 80,255 trips over the next 10 years. To maintain the existing level of service, Tempe will need to acquire approximately three fire apparatus over the next 10 years. The following pages include a more detailed projection of demand for services and costs for the Fire Facilities IIP.

Fire Apparatus – Incremental Expansion

Tempe plans to maintain its existing level of service for fire apparatus over the next 10 years. Based on a projected population increase of 24,798 persons, future residential development demands an additional 1.70 units of fire apparatus (24,798 additional persons X 0.00007 units per person). With projected nonresidential growth of 80,255 vehicle trips, future nonresidential development demands an additional 1.06 units of fire apparatus (80,255 additional vehicle trips X 0.00001 units per vehicle trip). Future development demands 2.76 additional units of fire apparatus at a cost of $2,137,034 (2.76 units X $774,000 per unit).

Figure F10: Projected Demand for Fire Apparatus

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Fire Apparatus	0.00007 Units	per Person	$774,000
	0.00001 Units	per Vehicle Trip	

Demand for Fire Apparatus					
Year	Population	Vehicle Trips	Units		
			Residential	Nonresidential	Total
2021	191,033	523,917	13.07	6.93	20.00
2022	193,777	531,779	13.26	7.03	20.29
2023	196,521	539,641	13.45	7.13	20.58
2024	199,265	547,503	13.64	7.24	20.88
2025	202,009	555,365	13.82	7.34	21.17
2026	204,283	563,542	13.98	7.45	21.43
2027	206,557	571,719	14.14	7.56	21.69
2028	208,831	579,895	14.29	7.67	21.96
2029	211,105	588,072	14.45	7.77	22.22
2030	213,379	596,249	14.60	7.88	22.49
2031	215,831	604,172	14.77	7.99	22.76
10-Yr Increase	24,798	80,255	1.70	1.06	2.76

Growth-Related Expenditures	$1,315,800	$821,234	$2,137,034

FIRE FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

The Fire Facilities development fees include a revenue credit/offset related to fire bonds. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Fire Facilities Development Fees

Infrastructure components and cost factors for Fire Facilities are summarized in the upper portion of Figure F11. The cost per service unit for Fire Facilities is $192.34 per person and $31.82 per vehicle trip.

Fire Facilities development fees for residential development are assessed according to the number of persons per housing unit. The residential fee of $414 for a dwelling with 1,800 square feet of living space is calculated using a cost per service unit of $192.34 per person multiplied by a demand unit of 2.15 persons per housing unit.

Nonresidential development fees are calculated using vehicle trips as the service unit. The fee of $79 per 1,000 square feet of industrial development is derived from a cost per service unit of $31.82 per vehicle trip multiplied by a demand unit of 2.48 vehicle trips per 1,000 square feet.

Figure F11: Schedule of Fire Facilities Development Fees

Fee Component	Cost per Person	Cost per Trip
Fire Facilities	$146.25	$22.82
Fire Apparatus	$52.97	$10.23
Development Fee Report	$0.82	$0.23
Fire Bonds Credit	($7.70)	($1.46)
Total	$192.34	$31.82

Residential Fees per Unit				
Square Feet of Living Space	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Difference
900 or less	1.02	$196	$233	($37)
901 to 1,400	1.68	$323	$383	($60)
1,401 to 1,900	2.15	$414	$487	($73)
1,901 or more	2.50	$481	$562	($81)

Nonresidential Fees per 1,000 Square Feet				
Development Type	Avg Weekday Vehicle Trips[1]	Proposed Fees	Current Fees	Difference
Industrial	2.48	$79	$124	($45)
Commercial	12.46	$397	$148	$249
Office & Other Services	4.87	$155	$259	($104)
Institutional	6.44	$205	$66	$139

1. See Land Use Assumptions

Fire Facilities Development Fee Revenue

Appendix A contains the forecast of revenues required by Arizona's enabling legislation (ARS § 9-463.05(E)(7)). In accordance with state law, this report includes an IIP for Fire Facilities needed to accommodate future development. Projected fee revenue shown in Figure F12 is based on the development projections in the *Land Use Assumptions* document and the updated Fire Facilities development fees. If development occurs at a more rapid rate than projected, the demand for infrastructure will increase and development fee revenue will increase at a corresponding rate. If development occurs at a slower rate than projected, the demand for infrastructure will also decrease, along with development fee revenue. Projected development fee revenue equals $10,804,716, and projected expenditures equal $16,654,941. Existing development's share of $5,108,616 may not be funded with development fees.

Figure F12: Projected Fire Facilities Development Fee Revenue

Fee Component	Growth Share	Existing Share	Total
Fire Facilities	$9,952,302	$5,108,616	$15,060,918
Fire Apparatus	$2,137,034	$0	$2,137,034
Development Fee Report	$20,000	$0	$20,000
Fire Bonds Credit	($563,010)	$0	($563,010)
Total	$11,546,325	$5,108,616	$16,654,941

		Single Family $414 per unit	Multi-Family $323 per unit	Industrial $79 per sq ft	Commercial $397 per sq ft	Office & Other $155 per sq ft	Institutional $205 per sq ft
Year		Hsg Unit	Hsg Unit	KSF	KSF	KSF	KSF
Base	2021	42,663	42,379	29,206	13,980	36,786	15,241
Year 1	2022	42,801	43,669	29,581	14,127	37,386	15,581
Year 2	2023	42,939	44,959	29,956	14,273	37,986	15,920
Year 3	2024	43,077	46,249	30,332	14,419	38,587	16,260
Year 4	2025	43,215	47,539	30,707	14,565	39,187	16,600
Year 5	2026	43,234	48,736	31,007	14,658	39,841	17,079
Year 6	2027	43,253	49,933	31,307	14,752	40,495	17,558
Year 7	2028	43,273	51,129	31,607	14,845	41,149	18,037
Year 8	2029	43,292	52,326	31,906	14,938	41,803	18,516
Year 9	2030	43,311	53,523	32,206	15,032	42,457	18,995
Year 10	2031	43,315	54,836	32,383	15,080	43,143	19,545
Year 15	2036	43,334	60,969	33,165	15,299	46,462	22,242
Year 20	2041	43,359	65,360	33,554	15,428	49,338	24,725
20-Year Increase		695	22,980	4,348	1,447	12,551	9,484
Projected Revenue		$282,294	$6,466,334	$311,983	$527,291	$1,625,824	$1,590,990

Projected Fee Revenue	$10,804,716
Existing Development Share	$5,108,616
Total Expenditures	$16,654,941

PARKS AND RECREATIONAL FACILITIES IIP

ARS § 9-463.05 (T)(7)(g) defines the facilities and assets that can be included in the Parks and Recreational Facilities IIP:

> *"Neighborhood parks and recreational facilities on real property up to thirty acres in area, or parks and recreational facilities larger than thirty acres if the facilities provide a direct benefit to the development. Park and recreational facilities do not include vehicles, equipment or that portion of any facility that is used for amusement parks, aquariums, aquatic centers, auditoriums, arenas, arts and cultural facilities, bandstand and orchestra facilities, bathhouses, boathouses, clubhouses, community centers greater than three thousand square feet in floor area, environmental education centers, equestrian facilities, golf course facilities, greenhouses, lakes, museums, theme parks, water reclamation or riparian areas, wetlands, zoo facilities or similar recreational facilities, but may include swimming pools."*

The Parks and Recreational Facilities IIP includes components for park improvements, park facilities, multi-use paths, pools, and the cost of preparing the Parks and Recreational Facilities IIP and related Development Fee Report. The incremental expansion methodology is used for park improvements, park facilities, and multi-use paths. A plan-based methodology is used for pools and the Development Fee Report.

Service Area

Tempe plans to provide a uniform level of service and equal access to parks and recreational facilities within the city limits; therefore, there is a single service area for the Parks and Recreational IIP.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Parks and Recreational Facilities IIP and development fees will allocate the cost of public services between residential and nonresidential based on daytime population. The Arizona Office of Economic Opportunity estimates Tempe's 2017 population equal to 179,794 persons. Based on 2017 estimates from the U.S. Census Bureau's OnTheMap web application, 201,253 inflow commuters traveled to Tempe for work. The proportionate share is based on cumulative impact hours per year with a resident potentially impacting parks and recreational facilities 4,380 hours per year (12 hours per day X 365 days per year). An inflow commuter potentially impacts parks and recreational facilities 500 hours per year (two hours per day X five days per week X 50 weeks per year). For parks and recreational facilities, residential development generates 89 percent of demand and nonresidential development generates the remaining 11 percent of demand.

Figure PR1: Proportionate Share

Development Type	Service Unit	Impact Hours per Year	Cumulative Impact Hours per Year	Proportionate Share
Residential	179,794 residents[1]	4,380	787,497,720	89%
Nonresidential	201,253 inflow commuters[2]	500	100,626,500	11%
Total			888,124,220	100%

1. Arizona Office of Economic Opportunity, 2017

2. U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics, Version 6.6 , 2017

Residential Impact: 12 hours per day X 365 days per year

Nonresidential Impact: 2 hours per day X 5 days per week X 50 weeks per year

The proportionate share of costs attributable to residential development will be allocated to population and then converted to an appropriate amount by type of housing unit, based on housing unit size. Since demand for parks was unavailable by specific nonresidential use (i.e., retail, office, industrial, etc.), TischlerBise recommends using jobs as the best demand indicator for nonresidential demand for parks. Employment density is highest for office development and lowest for institutional development. Commercial and industrial employment densities fall between the other two categories. This ranking of employment densities is consistent with the relative demand for parks from nonresidential development.

Ratio of Service Unit to Development Unit

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure PR2 displays the demand indicators for residential and nonresidential land uses. For residential development, the table displays the number of persons per housing unit. For nonresidential development, the table displays the number of employees per thousand square feet of floor area.

Figure PR2: Ratio of Service Unit to Development Unit

Residential Development	
Square Feet of Living Space	Persons per Housing Unit[1]
900 or less	1.02
901 to 1,400	1.68
1,401 to 1,900	2.15
1,901 or more	2.50

Nonresidential Development	
Development Type	Jobs per 1,000 Sq Ft[1]
Industrial	1.63
Commercial	2.34
Office & Other Services	2.97
Institutional	0.93

1. See Land Use Assumptions

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Park Improvements – Incremental Expansion

Tempe currently provides 3,641.5 park improvements in its existing parks, and the City plans to construct additional park improvements to serve future development. Based on costs provided by Tempe's Parks and Recreation Department to construct recent park improvements, the total cost of Tempe's existing park improvements is $141,972,383. The weighted average cost is $38,987 per park improvement ($141,972,383total cost / 3,641.5 park improvements).

Figure PR3: Existing Park Improvements

Description	Improvements	Unit Cost	Total Cost
Bocce Ball	1.0	$43,750	$43,750
Batting cages	10.0	$7,500	$75,000
BMX/Bike Track	1.0	$625,000	$625,000
Horseshoes	14.0	$6,250	$87,500
Climbing Wall Feature	2.0	$10,000	$20,000
Concessions	4.0	$143,350	$573,400
Community Garden	3.0	$37,500	$112,500
Disc Golf	1.0	$75,000	$75,000
Dog Park	6.0	$204,268	$1,225,608
Volleyball (sand)	25.0	$75,000	$1,875,000
Parcourse/Fitness Stations	12.0	$125,000	$1,500,000
Pickleball (outdoor)	12.0	$100,000	$1,200,000
Playground	44.0	$625,000	$27,500,000
Restrooms	43.0	$375,000	$16,125,000
Skate Park	4.0	$1,000,000	$4,000,000
Splash Play	4.0	$1,500,000	$6,000,000
Tennis Courts	51.0	$150,000	$7,650,000
Marked Parking Spots	3,186.0	$2,438	$7,765,875
Handball/Raquetball	24.0	$68,750	$1,650,000
Baseball Fields w/Lights	25.0	$862,500	$21,562,500
Basketball Courts w/Lights	41.5	$200,000	$8,300,000
Soccer Fields w/Lights	23.0	$812,500	$18,687,500
Soccer Fields w/o Lights	18.0	$500,000	$9,000,000
Picnic/Ramada Facilities (small)	49.0	$56,250	$2,756,250
Picnic/Ramada Facilities (large)	38.0	$93,750	$3,562,500
Total	3,641.5	$38,987	$141,972,383

To allocate the proportionate share of demand for park improvements to residential and nonresidential development, this analysis uses the proportionate share shown in Figure PR1. Tempe's existing LOS for residential development is 0.0169 improvements per person (3,641.5 improvements X 89 percent residential share / 191,033 persons). For nonresidential development, the existing LOS is 0.0020 improvements per job (3,641.5 improvements X 11 percent nonresidential share / 203,555 jobs).

Based on the total cost of Tempe's existing park improvements, the weighted average cost for new park improvements is $38,987 per improvement ($141,972,383 total cost / 3,641.5 improvements). Tempe may use development fees to construct additional park improvements similar to its existing inventory. For park improvements, the cost is $658.98 per person (0.0169 improvements per person X $38,987 per amenity) and $79.02 per job (0.0020 improvements per job X $38,987 per amenity).

Figure PR4: Park Improvements Level of Service

Cost Factors	
Weighted Average per Improvement	$38,987

Level-of-Service (LOS) Standards	
Existing Improvements	3,641.5
Residential	
Residential Share	89%
2021 Population	191,033
Improvements per Person	0.0169
Cost per Person	$658.98
Nonresidential	
Nonresidential Share	11%
2021 Jobs	203,555
Improvements per Job	0.0020
Cost per Job	$79.02

Source: Tempe Parks & Recreation Department

Park Facilities – Incremental Expansion

Tempe currently provides 171,700 square feet of park facilities, however, the Enabling Legislation limits park facilities to three thousand square feet. Since an average size park facility in Tempe is 28,617 square feet, the analysis uses an adjustment factor of approximately 10.5 percent to reduce the average size park facility to 3,000 square feet. When the adjustment factor is applied to the total square footage, Tempe has 18,000 eligible square feet (171,700 total square feet X 10.5 percent adjustment factor) resulting in an average size park facility of 3,000 square feet (18,000 eligible square feet / six park facilities).

Figure PR5: Existing Park Facilities

Description	Square Feet
Escalante Community Center	35,000
Clark Park Recreation Center	2,200
Kiwanis Community Center	56,200
Pyle Adult Center	20,600
Westside Community Center	28,300
North Multi-Generational Center	29,400
Total	171,700

Level-of-Service (LOS) Standards	
Eligible (per Community Center)	3,000
Average Size	28,617
Adjustment (Eligible / Average)	10.5%
Eligible Square Feet	18,000

Source: Tempe Parks & Recreation Department

To allocate the proportionate share of demand for park facilities to residential and nonresidential development, this analysis uses the proportionate share shown in Figure PR1. Tempe's eligible LOS for residential development is 0.0835 square feet per person (18,000 eligible square feet X 89 percent residential share / 191,033 persons). For nonresidential development, the eligible LOS is 0.0100 square feet per job (18,000 eligible square feet X 11 percent nonresidential share / 203,555 jobs).

Tempe's Parks and Recreation Department provided a construction cost factor of $600 per square foot based on recent and planned park facilities. For park facilities, the cost is $50.13 per person (0.0835 eligible square feet per person X $600 per square foot) and $6.01 per job (0.0100 eligible square feet per job X $600 per square foot).

Figure PR6: Park Facilities Level of Service

Cost Factors	
Cost per Square Foot	$600

Level-of-Service (LOS) Standards	
Eligible (per Community Center)	3,000
Average Size	28,617
Adjustment (Eligible / Average)	10.5%
Eligible Square Feet	18,000
Residential	
Residential Share	89%
2021 Population	191,033
Square Feet per Person	0.0835
Cost per Person	$50.13
Nonresidential	
Nonresidential Share	11%
2021 Jobs	203,555
Square Feet per Job	0.0100
Cost per Job	$6.01

Source: Tempe Parks & Recreation Department

Multi-Use Paths – Incremental Expansion

Tempe currently provides 40.5 miles of multi-use paths, and the City plans to construct additional multi-use paths to serve future development. To allocate the proportionate share of demand for multi-use paths to residential and nonresidential development, this analysis uses the proportionate share shown in Figure PR1. Tempe's existing LOS for residential development is 0.00019 miles per person (40.5 miles X 89 percent residential share / 191,033 persons). For nonresidential development, the existing LOS is 0.00002 miles per job (40.5 miles X 11 percent nonresidential share / 203,555 jobs).

Based on recent and planned cost estimates provided by Tempe's Parks and Recreation Department, the cost for multi-use paths is $1,500,000 per mile. For multi-use paths, the cost is $281.98 per person (0.00019 miles per person X $1,500,000 per mile) and $33.81 per job (0.00002 miles per job X $1,500,000 per mile).

Figure PR7: Multi-Use Paths Level of Service

Description	Miles
Multi-Use Paths	40.50

Cost Factors	
Cost per Mile	$1,500,000

Level-of-Service (LOS) Standards	
Existing Miles	40.50
Residential	
Residential Share	89%
2021 Population	191,033
Miles per Person	0.00019
Cost per Person	$281.98
Nonresidential	
Nonresidential Share	11%
2021 Jobs	203,555
Miles per Job	0.00002
Cost per Job	$33.81

Source: Tempe Parks & Recreation Department

Pools – Plan-Based

The legislation for Senate Bill 1525 prohibits aquatic centers but allows swimming pools, however, no definition is provided in the Enabling Legislation. The City of Chandler's System Development Fee Update (2018) references the League of Arizona Cities and Towns proposed definition of an aquatic center to provide clarification:

> *"An aquatic center is a facility designed to host non-recreational competitive functions generally occurring within water; including, not limited to, water polo games, swimming meets, and diving events. Such facility may be indoors, outdoors, or any combination thereof, and includes all necessary supporting amenities, including but not limited to, locker rooms, offices, snack bars, bleacher seating, and shade structures."*

The planned pool will be constructed in Clark Park to provide a citywide benefit, and it will not be designed or built to meet the proposed definition of an aquatic center as defined by the League of Arizona Cities and Towns. As a necessary function of the pool, the construction may include changing rooms, restrooms, storage for pool equipment and chemicals, parking, etc.

Tempe currently provides three pools to existing development, and it plans to construct an additional pool in Clark Park to accommodate future development. To allocate the proportionate share of demand for pools to residential and nonresidential development, this analysis uses the proportionate share shown in Figure PR1. To ensure future development does not pay for a higher level of service than provided to existing development, costs for the Clark Park pool are allocated to all development in 2031. Tempe's planned LOS for residential development is 0.000016 pools per person (four pools X 89 percent residential share / 215,831 persons in 2031). For nonresidential development, the planned LOS is 0.000002 pools per job (four pools X 11 percent nonresidential share / 234,158 jobs in 2031).

Based on the planned costs provided by Tempe's Parks and Recreation Department, the Clark Park pool will cost $7,670,015. For pools, the cost is $126.04 per person (0.000016 pools per person X $7,670,015 per pool) and $14.85 per job (0.000002 pools per job X $7,670,015 per pool).

Figure PR8: Pools Level of Service

Description	Pools
Escalante (Existing)	1.0
Kiwanis (Existing)	1.0
McClintock (Existing)	1.0
Clark (Planned)	1.0
Total	4.0

Cost Factors	
Clark Park Pool	$7,670,015

Level-of-Service (LOS) Standards	
2031 Pools	4.0
Residential	
Residential Share	89%
2031 Population	215,831
Pools per Person	0.000016
Cost per Person	$126.04
Nonresidential	
Nonresidential Share	11%
2031 Jobs	234,158
Pools per Job	0.000002
Cost per Job	$14.85

Source: Tempe Parks & Recreation Department

Development Fee Report – Plan-Based

The cost to prepare the Parks and Recreational Facilities IIP and development fees totals $23,370. Tempe plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new development from the *Land Use Assumptions* document, the cost is $1.56 per person and $0.17 per job.

Figure PR9: IIP and Development Fee Report

Necessary Public Service	Cost	Proportionate Share		Service Unit	5-Year Change	Cost per Service Unit
Fire	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Parks and Recreational	$23,370	Residential	89%	Population	13,250	$1.56
		Nonresidential	11%	Jobs	15,288	$0.17
Police	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Total	$63,370					

Projected Demand for Services and Costs

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

As shown in the *Land Use Assumptions* document, Tempe's population is expected to increase by 24,798 persons and employment is expected to increase by 30,603 jobs over the next 10 years. To maintain the existing levels of service, Tempe will need to construct 481.2 park improvements, 2,378 square feet of park facilities, and 5.35 miles of multi-use paths over the next 10 years. To reach the planned level of service for pools, Tempe will need to construct one additional pool. The following pages include a more detailed projection of demand for services and costs for the Parks and Recreational Facilities IIP.

Park Improvements – Incremental Expansion

Tempe plans to maintain its existing level of service for park improvements over the next 10 years. Based on a projected population increase of 24,798 persons, future residential development demands an additional 419.1 park improvements (24,798 additional persons X 0.0169 improvements per person). With projected employment growth of 30,603 jobs, future nonresidential development demands an additional 62.0 park improvements (30,603 additional jobs X 0.0020 improvements per job). Future development demands 481.2 additional park improvements at a cost of $18,759,780 (481.2 improvements X $38,987 per improvement).

Figure PR10: Projected Demand for Park Improvements

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Park Improvements	0.0169 Improvements	per Person	$38,987
	0.0020 Improvements	per Job	

Demand for Park Improvements					
Year	Population	Jobs	Improvements		
			Residential	Nonresidential	Total
2020	191,033	203,555	3,228.9	412.6	3,641.5
2021	193,777	206,604	3,275.3	418.8	3,694.1
2022	196,521	209,653	3,321.7	425.0	3,746.6
2023	199,265	212,702	3,368.0	431.1	3,799.2
2024	202,009	215,751	3,414.4	437.3	3,851.7
2025	204,283	218,843	3,452.9	443.6	3,896.4
2026	206,557	221,935	3,491.3	449.8	3,941.1
2027	208,831	225,027	3,529.7	456.1	3,985.9
2028	211,105	228,119	3,568.2	462.4	4,030.6
2029	213,379	231,211	3,606.6	468.6	4,075.3
2030	215,831	234,158	3,648.1	474.6	4,122.7
10-Yr Increase	24,798	30,603	419.1	62.0	481.2

Growth-Related Expenditures	$16,341,399	$2,418,381	$18,759,780

Park Facilities – Incremental Expansion

Tempe plans to maintain its existing level of service for eligible park facilities over the next 10 years. Based on a projected population increase of 24,798 persons, future residential development demands an additional 2,072 square feet of park facilities (24,798 additional persons X 0.0835 square feet per person). With projected employment growth of 30,603 jobs, future nonresidential development demands an additional 307 square feet of park facilities (30,603 additional jobs X 0.0100 square feet per job). Future development demands 2,378 square feet of park facilities at a cost of $1,427,078 (2,378 square feet X $600 per square foot).

Figure PR11: Projected Demand for Park Facilities

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Park Facilities	0.0835 Square Feet	per Person	$600
	0.0100 Square Feet	per Job	

Demand for Park Facilities					
Year	Population	Jobs	Eligible Square Feet		
			Residential	Nonresidential	Total
2020	191,033	203,555	15,961	2,039	18,000
2021	193,777	206,604	16,190	2,070	18,260
2022	196,521	209,653	16,419	2,101	18,520
2023	199,265	212,702	16,648	2,131	18,779
2024	202,009	215,751	16,878	2,162	19,039
2025	204,283	218,843	17,068	2,193	19,260
2026	206,557	221,935	17,258	2,224	19,481
2027	208,831	225,027	17,448	2,255	19,702
2028	211,105	228,119	17,638	2,286	19,923
2029	213,379	231,211	17,828	2,317	20,144
2030	215,831	234,158	18,032	2,346	20,378
10-Yr Increase	24,798	30,603	2,072	307	2,378

Growth-Related Expenditures	$1,243,109	$183,969	$1,427,078

Multi-Use Paths – Incremental Expansion

Tempe plans to maintain its existing level of service for multi-use paths over the next 10 years. Based on a projected population increase of 24,798 persons, future residential development demands an additional 4.66 miles of multi-use paths (24,798 additional persons X 0.00019 miles per person). With projected employment growth of 30,603 jobs, future nonresidential development demands an additional 0.69 miles of multi-use paths (30,603 additional jobs X 0.00002 miles per job). Future development demands 5.35 additional miles of multi-use paths at a cost of $8,027,312 (5.74 miles X $1,500,000 per mile).

Figure PR12: Projected Demand for Multi-Use Paths

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Multi-Use Paths	0.00019 Miles	per Person	$1,500,000
	0.00002 Miles	per Job	

Demand for Multi-Use Paths					
Year	Population	Jobs	Miles		
			Residential	Nonresidential	Total
2020	191,033	203,555	35.91	4.59	40.50
2021	193,777	206,604	36.43	4.66	41.08
2022	196,521	209,653	36.94	4.73	41.67
2023	199,265	212,702	37.46	4.79	42.25
2024	202,009	215,751	37.97	4.86	42.84
2025	204,283	218,843	38.40	4.93	43.34
2026	206,557	221,935	38.83	5.00	43.83
2027	208,831	225,027	39.26	5.07	44.33
2028	211,105	228,119	39.68	5.14	44.83
2029	213,379	231,211	40.11	5.21	45.32
2030	215,831	234,158	40.57	5.28	45.85
10-Yr Increase	24,798	30,603	4.66	0.69	5.35

Growth-Related Expenditures	$6,992,487	$1,034,826	$8,027,312

Pools – Plan-Based

Tempe plans to construct a pool at Clark Park to serve development through 2031. Based on a projected population increase of 24,798 persons, Tempe's future residential development demands 0.408 additional pools (24,798 additional persons X 0.000016 pools per person). Future nonresidential development demands 0.059 additional pools (30,603 additional jobs X 0.000002 pools per job) over the next 10 years. Future development demands approximately 46.7 percent of the planned Clark Park pool with a growth-related cost of approximately $3,579,926 (0.467 pools X $7,670,015 per pool).

Existing residential development demands 3.139 pools (191,033 persons X 0.000016 pools per person) and existing nonresidential development demands approximately 0.394 pools (203,555 jobs X 0.000002 pools per job). Since Tempe currently has three pools, existing development currently demands approximately 0.533 additional pools (3.533 pools demanded by existing development – 3.0 pools available to existing development) to reach the planned level of service. Existing development's share of the planned Clark Park pool is approximately $4,090,089 (0.533 pools X $7,670,015 per pool).

Figure PR13: Projected Demand for Pools

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Pools	0.000016 Pools	per Person	$7,670,015
	0.000002 Pools	per Job	

Demand for Pools					
Year	Population	Jobs	Pools		
			Residential	Nonresidential	Total
2021	191,033	203,555	3.139	0.394	3.533
2022	193,777	206,604	3.184	0.400	3.584
2023	196,521	209,653	3.229	0.406	3.635
2024	199,265	212,702	3.275	0.412	3.686
2025	202,009	215,751	3.320	0.418	3.737
2026	204,283	218,843	3.357	0.424	3.781
2027	206,557	221,935	3.394	0.430	3.824
2028	208,831	225,027	3.432	0.436	3.867
2029	211,105	228,119	3.469	0.442	3.911
2030	213,379	231,211	3.506	0.448	3.954
2031	215,831	234,158	3.547	0.453	4.000
10-Yr Increase	24,798	30,603	0.408	0.059	0.467

Growth-Related Expenditures	$3,125,619	$454,307	$3,579,926
Existing Development Expenditures	$3,626,673	$463,416	$4,090,089
Total Expenditures	$6,752,291	$917,724	$7,670,015

PARKS AND RECREATIONAL FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for Parks and Recreational Facilities fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Parks and Recreational Facilities Development Fees

Infrastructure components and cost factors for Parks and Recreational Facilities are summarized in the upper portion of Figure PR14. The cost per service unit is $1,118.69 per person and $133.86 per job.

Parks and Recreational Facilities development fees for residential development are assessed according to the number of persons per housing unit. The residential fee of $2,405 for a dwelling with 1,800 square feet of living space is calculated using a cost per service unit of $1,118.69 per person multiplied by a demand unit of 2.15 persons per housing unit.

Nonresidential development fees are calculated using jobs as the service unit. The fee of $218 per 1,000 square feet of industrial development is derived from a cost per service unit of $133.86 per job multiplied by a demand unit of 1.63 jobs per 1,000 square feet.

Figure PR14: Schedule of Parks and Recreational Facilities Development Fees

Fee Component	Cost per Person	Cost per Job
Park Improvements	$658.98	$79.02
Park Facilities	$50.13	$6.01
Multi-Use Paths	$281.98	$33.81
Pools	$126.04	$14.85
Development Fee Report	$1.56	$0.17
Total	$1,118.69	$133.86

Residential Fees per Unit				
Square Feet of Living Space	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Difference
900 or less	1.02	$1,141	$412	$729
901 to 1,400	1.68	$1,879	$676	$1,203
1,401 to 1,900	2.15	$2,405	$859	$1,546
1,901 or more	2.50	$2,797	$991	$1,806

Nonresidential Fees per 1,000 Square Feet				
Development Type	Jobs per 1,000 Sq Ft[1]	Proposed Fees	Current Fees	Difference
Industrial	1.63	$218	$211	$7
Commercial	2.34	$313	$251	$62
Office & Other Services	2.97	$398	$438	($40)
Institutional	0.93	$124	$113	$11

1. See Land Use Assumptions

PARKS AND RECREATIONAL FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)). In accordance with state law, this report includes an IIP for Parks and Recreational Facilities needed to accommodate new development. Projected fee revenue shown in Figure PR15 is based on the development projections in the *Land Use Assumptions* document and the updated development fees for Parks and Recreational Facilities shown in Figure PR14. If development occurs at a more rapid rate than projected, the demand for infrastructure will increase and development fee revenue will increase at a corresponding rate. If development occurs at a slower rate than projected, the demand for infrastructure will also decrease, along with development fee revenue. Projected development fee revenue equals $29,059,659, and projected expenditures equal $35,907,555. Existing development's share of $4,090,089 may not be funded with development fees.

Figure PR15: Projected Parks and Recreational Facilities Development Fee Revenue

Fee Component	Growth Share	Existing Share	Total
Park Improvements	$18,759,780	$0	$18,759,780
Park Facilities	$1,427,078	$0	$1,427,078
Multi-Use Paths	$8,027,312	$0	$8,027,312
Pools	$3,579,926	$4,090,089	$7,670,015
Development Fee Report	$23,370	$0	$23,370
Total	$31,817,466	$4,090,089	$35,907,555

		Single Family $2,405 per unit	Multi-Family $1,879 per unit	Industrial $218 per sq ft	Commercial $313 per sq ft	Office & Other $398 per sq ft	Institutional $124 per sq ft
Year		Hsg Unit	Hsg Unit	KSF	KSF	KSF	KSF
Base	2021	42,663	42,379	29,206	13,980	36,786	15,241
Year 1	2022	42,801	43,669	29,581	14,127	37,386	15,581
Year 2	2023	42,939	44,959	29,956	14,273	37,986	15,920
Year 3	2024	43,077	46,249	30,332	14,419	38,587	16,260
Year 4	2025	43,215	47,539	30,707	14,565	39,187	16,600
Year 5	2026	43,234	48,736	31,007	14,658	39,841	17,079
Year 6	2027	43,253	49,933	31,307	14,752	40,495	17,558
Year 7	2028	43,273	51,129	31,607	14,845	41,149	18,037
Year 8	2029	43,292	52,326	31,906	14,938	41,803	18,516
Year 9	2030	43,311	53,523	32,206	15,032	42,457	18,995
Year 10	2031	43,315	54,836	32,383	15,080	43,143	19,545
10-Year Increase		651	12,457	3,177	1,099	6,357	4,304
Projected Revenue		$1,566,197	$23,395,569	$692,763	$344,217	$2,525,503	$535,410

Projected Fee Revenue	$29,059,659
Existing Development Share	$4,090,089
Total Expenditures	$35,907,555

POLICE FACILITIES IIP

ARS § 9-463.05 (T)(7)(f) defines the facilities and assets that can be included in the Police Facilities IIP:

> *"Fire and police facilities, including all appurtenances, equipment and vehicles. Fire and police facilities do not include a facility or portion of a facility that is used to replace services that were once provided elsewhere in the municipality, vehicles and equipment used to provide administrative services, helicopters or airplanes or a facility that is used for training firefighters or officers from more than one station or substation."*

The Police Facilities IIP includes components for police facilities and the cost of preparing the Police Facilities IIP and related Development Fee Report. The incremental expansion methodology, based on the current level of service, is used for police facilities. A plan-based methodology is used for the Development Fee Report.

Service Area

Tempe's Police Department strives to provide a uniform response time within the city limits; therefore, there is a single service area for the Police Facilities IIP.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Police Facilities IIP and development fees will allocate the cost of police services between residential and nonresidential based on functional population. Based on 2017 estimates from the U.S. Census Bureau's OnTheMap web application, residential development accounts for approximately 54 percent of functional population and nonresidential development accounts for the remaining 46 percent.

Figure P1: Proportionate Share

Demand Units in 2017					
Residential				Demand Hours/Day	Person Hours
	Population	179,794			
	Residents Not Working		99,927	20	1,998,540
	Employed Residents		79,867		
	Employed in Tempe			21,634	14	302,876
	Employed outside Tempe			58,233	14	815,262
				Residential Subtotal	3,116,678
				Residential Share	**54%**
Nonresidential					
	Non-working Residents		99,927		4	399,708
	Jobs Located in Tempe		222,887		
	Residents Employed in Tempe			21,634	10	216,340
	Non-Resident Workers (inflow commuters)			201,253	10	2,012,530
				Nonresidential Subtotal	2,628,578
				Nonresidential Share	**46%**
				Total	5,745,256

Source: Arizona Office of Economic Opportunity (population), U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics, Version 6.6 (employment).

The proportionate share of costs attributable to residential development will be allocated to population and then converted to an appropriate amount by type of housing unit, based on housing unit size. Since nonresidential calls for service were unavailable by specific nonresidential use (i.e., retail, office, industrial, etc.), TischlerBise recommends using average weekday vehicle trips as the best demand indicator for nonresidential demand for police services. Trip generation rates are highest for commercial development, such as a shopping center, and lowest for industrial development. Office and institutional trip rates fall between the other two categories. This ranking of trip rates is consistent with the relative demand for police services from nonresidential development.

Ratio of Service Unit to Development Unit

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure P2 displays the demand indicators for residential and nonresidential land uses. For residential development, the table displays the persons per housing unit. For nonresidential development, the table displays the number of average weekday vehicle trips generated per thousand square feet of floor area.

Figure P2: Ratio of Service Unit to Development Unit

Residential Development	
Development Type	Persons per Housing Unit[1]
900 or less	1.02
901 to 1,400	1.68
1,401 to 1,900	2.15
1,901 or more	2.50

Nonresidential Development			
Development Type	AWVTE per 1,000 Sq Ft[1]	Trip Rate Adjustment	AWVT per 1,000 Sq Ft[1]
Industrial	4.96	50%	2.48
Commercial	37.75	33%	12.46
Office & Other Services	9.74	50%	4.87
Institutional	19.52	33%	6.44

1. See Land Use Assumptions

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Police Facilities – Incremental Expansion

The City of Tempe currently provides 158,823 square feet of police facilities, and the City plans to construct additional police facilities to serve future development. To allocate the proportionate share of demand for police facilities to residential and nonresidential development, this analysis uses functional population outlined in Figure P1. Tempe's existing level of service for residential development is 0.4490 square feet per person (158,823 square feet X 54 percent residential share / 191,033 persons). The nonresidential level of service is 0.1394 square feet per vehicle trip (158,823 square feet X 46 percent nonresidential share / 523,917 vehicle trips).

Based on estimates provided by Tempe, the construction cost for a police facility is $550 per square foot. Tempe may choose to expand the existing police facilities or to construct additional police facilities. For police facilities, the cost is $246.92 per person (0.4490 square feet per person X $550 per square foot) and $76.70 per vehicle trip (0.1394 square feet per vehicle trip X $550 per square foot).

Figure P3: Police Facilities Level of Service

Description	Square Feet
120 E 5th St (Headquarters)	49,231
1855 E Apache Blvd	80,276
8201 S Hardy Dr (South Substation)	25,716
10 W Guadalupe (Kiwanis Substation)	3,100
31 E 5th Street (City Hall Bike Unit)	500
Total	158,823

Cost Factors	
Cost per Square Foot	$550

Level-of-Service (LOS) Standards	
Existing Square Feet	158,823
Residential	
Residential Share	54%
2021 Population	191,033
Square Feet per Person	0.4490
Cost per Person	$246.92
Nonresidential	
Nonresidential Share	46%
2021 Vehicle Trips	523,917
Square Feet per Vehicle Trip	0.1394
Cost per Vehicle Trip	$76.70

Source: Tempe Police Department

Development Fee Report – Plan-Based

The cost to prepare the Police Facilities IIP and related Development Fee Report totals $20,000. Tempe plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new residential and nonresidential development from the *Land Use Assumptions* document, the cost is $0.82 per person and $0.23 per vehicle trip.

Figure P4: IIP and Development Fee Report

Necessary Public Service	Cost	Proportionate Share		Service Unit	5-Year Change	Cost per Service Unit
Fire	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Parks and Recreational	$23,370	Residential	89%	Population	13,250	$1.56
		Nonresidential	11%	Jobs	15,288	$0.17
Police	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Total	$63,370					

Projected Demand for Services and Costs

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

As shown in the *Land Use Assumptions* document, Tempe's population is expected to increase by 24,798 persons and nonresidential vehicle trips generated are expected to increase by 80,255 trips over the next 10 years. To maintain the existing levels of service, Tempe will need to construct approximately 22,324 square feet of police facilities over the next 10 years. The following pages include a more detailed projection of demand for services and costs for the Police Facilities IIP.

Police Facilities – Incremental Expansion

Tempe plans to maintain its existing level of service for police facilities over the next 10 years. Based on a projected population increase of 24,798 persons, future residential development demands an additional 11,133.1 square feet of police facilities (24,798 additional persons X 0.4490 square feet per person). With projected nonresidential vehicle trip growth of 80,255 vehicle trips, future nonresidential development demands an additional 11,191.3 square feet of police facilities (80,255 additional vehicle trips X 0.1394 square feet per vehicle trip). Future development demands approximately 22,324 additional square feet of police facilities at a cost of $12,278,446 (22,324.4 square feet X $550 per square foot).

Figure P5: Projected Demand for Police Facilities

Type of Infrastructure	Level of Service	Demand Unit	Cost per Sq Ft
Police Facilities	0.4490 Square Feet	per Person	$550
	0.1394 Square Feet	per Veh. Trip	

Demand for Police Facilities					
Year	Population	Vehicle Trips	Square Feet		
			Residential	Nonresidential	Total
2021	191,033	523,917	85,764.4	73,058.6	158,823.0
2022	193,777	531,779	86,996.3	74,154.9	161,151.2
2023	196,521	539,641	88,228.2	75,251.3	163,479.5
2024	199,265	547,503	89,460.1	76,347.6	165,807.7
2025	202,009	555,365	90,692.0	77,444.0	168,135.9
2026	204,283	563,542	91,712.9	78,584.2	170,297.1
2027	206,557	571,719	92,733.9	79,724.4	172,458.2
2028	208,831	579,895	93,754.8	80,864.6	174,619.4
2029	211,105	588,072	94,775.8	82,004.8	176,780.6
2030	213,379	596,249	95,796.8	83,145.0	178,941.8
2031	215,831	604,172	96,897.5	84,249.9	181,147.4
10-Yr Increase	24,798	80,255	11,133.1	11,191.3	22,324.4
Growth-Related Expenditures			$6,123,216	$6,155,229	$12,278,446

POLICE FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for Police Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Police Facilities Development Fees

Infrastructure components and cost factors for Police Facilities are summarized in the upper portion of Figure P6. The cost per service unit for Police Facilities is $247.74 per person and $76.93 per vehicle trip.

Police Facilities development fees for residential development are assessed according to the number of persons per housing unit. The residential fee of $533 for a dwelling with 1,800 square feet of living space is calculated using a cost per service unit of $247.74 per person multiplied by a demand unit of 2.15 persons per housing unit.

Nonresidential development fees are calculated using vehicle trips as the service unit. The fee of $191 per 1,000 square feet of industrial development is derived from a cost per service unit of $76.93 per vehicle trip multiplied by a demand unit of 2.48 vehicle trips per 1,000 square feet.

Figure P6: Schedule of Police Facilities Development Fees

Fee Component	Cost per Person	Cost per Trip
Police Facilities	$246.92	$76.70
Development Fee Report	$0.82	$0.23
Total	$247.74	$76.93

Residential Fees per Unit				
Square Feet of Living Space	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Difference
900 or less	1.02	$253	$264	($11)
901 to 1,400	1.68	$416	$433	($17)
1,401 to 1,900	2.15	$533	$550	($17)
1,901 or more	2.50	$619	$635	($16)

Nonresidential Fees per 1,000 Square Feet				
Development Type	Avg Weekday Vehicle Trips[1]	Proposed Fees	Current Fees	Difference
Industrial	2.48	$191	$95	$96
Commercial	12.46	$959	$706	$253
Office & Other Services	4.87	$375	$276	$99
Institutional	6.44	$495	$255	$240

1. See Land Use Assumptions

POLICE FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains revenue forecasts required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)). Projected fee revenue shown in Figure P7 is based on the development projections in the *Land Use Assumptions* document and the updated Police Facilities development fees. If development occurs faster than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs slower than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Projected development fee revenue equals $11,687,357, and projected expenditures equal $12,298,446.

Figure P7: Projected Revenue from Police Facilities Development Fees

Fee Component	Growth Share	Existing Share	Total
Police Facilities	$12,278,446	$0	$12,278,446
Development Fee Report	$20,000	$0	$20,000
Total	$12,298,446	$0	$12,298,446

	Single Family $533 per unit	Multi-Family $416 per unit	Industrial $191 per sq ft	Commercial $959 per sq ft	Office & Other $375 per sq ft	Institutional $495 per sq ft
Year	Hsg Unit	Hsg Unit	KSF	KSF	KSF	KSF
Base 2021	42,663	42,379	29,206	13,980	36,786	15,241
Year 1 2022	42,801	43,669	29,581	14,127	37,386	15,581
Year 2 2023	42,939	44,959	29,956	14,273	37,986	15,920
Year 3 2024	43,077	46,249	30,332	14,419	38,587	16,260
Year 4 2025	43,215	47,539	30,707	14,565	39,187	16,600
Year 5 2026	43,234	48,736	31,007	14,658	39,841	17,079
Year 6 2027	43,253	49,933	31,307	14,752	40,495	17,558
Year 7 2028	43,273	51,129	31,607	14,845	41,149	18,037
Year 8 2029	43,292	52,326	31,906	14,938	41,803	18,516
Year 9 2030	43,311	53,523	32,206	15,032	42,457	18,995
Year 10 2031	43,315	54,836	32,383	15,080	43,143	19,545
10-Year Increase	651	12,457	3,177	1,099	6,357	4,304
Projected Revenue	$346,753	$5,176,151	$605,300	$1,052,676	$2,377,814	$2,128,663

Projected Fee Revenue	$11,687,357
Total Expenditures	$12,298,446

APPENDIX A: FORECAST OF REVENUES OTHER THAN FEES

ARS § 9-463.05(E)(7) requires:

> *"A forecast of revenues generated by new service units other than development fees, which shall include estimated state-shared revenue, highway users revenue, federal revenue, ad valorem property taxes, construction contracting or similar excise taxes and the capital recovery portion of utility fees attributable to development based on the approved land use assumptions, and a plan to include these contributions in determining the extent of the burden imposed by the development as required in subsection B, paragraph 12 of this section."*

ARS § 9-463.05(B)(12) states,

> *"The municipality shall forecast the contribution to be made in the future in cash or by taxes, fees, assessments or other sources of revenue derived from the property owner towards the capital costs of the necessary public service covered by the development fee and shall include these contributions in determining the extent of the burden imposed by the development. Beginning August 1, 2014, for purposes of calculating the required offset to development fees pursuant to this subsection, if a municipality imposes a construction contracting or similar excise tax rate in excess of the percentage amount of the transaction privilege tax rate imposed on the majority of other transaction privilege tax classifications, the entire excess portion of the construction contracting or similar excise tax shall be treated as a contribution to the capital costs of necessary public services provided to development for which development fees are assessed, unless the excess portion was already taken into account for such purpose pursuant to this subsection."*

REVENUE PROJECTIONS

Tempe does not have a higher-than-normal construction excise tax rate; therefore, the required offset described above is not applicable. Shown in Figure A1, Tempe's Municipal Budget Office provided the required forecast of non-development fee revenue from identified sources that can be attributed to future development over a period of five years. These funds are available for capital investments; however, the City of Tempe directs these revenues to non-development fee eligible capital needs including maintenance, repair, and replacement.

Figure A1: Revenue Projections

Fiscal Year	Inter-governmental	Secondary Property Tax Levies	Privilege and Use Tax	Total
FY19-20	$101,776,973	$29,911,357	$109,970,130	$241,658,460
FY20-21	$107,779,632	$31,424,894	$106,008,449	$245,212,976
FY21-22	$107,774,679	$32,988,227	$112,503,978	$253,266,884
FY22-23	$114,204,136	$34,423,131	$117,669,256	$266,296,522
FY23-24	$116,752,407	$36,002,475	$123,064,241	$275,819,123

Source: Municipal Budget Office, City of Tempe, Arizona

Only revenue generated by future development that is dedicated to growth-related capital improvements needs to be considered in determining the extent of the burden imposed by future development. Offsets against development fees are warranted in the following cases: (1) future development will be paying taxes or fees used to retire debt on existing facilities serving existing development; (2) future development will be paying taxes or fees used to fund an existing deficiency, or (3) future development will be paying taxes or fees that are dedicated to growth-related improvements. The analysis provided in this report identified the need for offsets against the Fire Facilities fees as shown in the Fire Facilities IIP.

Shown below, Figure A2 includes a comparison of projected revenue per person and job. Based on the revenue projections provided by Tempe's Municipal Budget Office and the development projections in the *Land Use Assumptions* document, revenue per person and job is projected to increase slightly over the five-year period outlined in Figure A1. These funds are available for capital investments; however, the City of Tempe directs these revenues to non-development fee eligible capital needs including maintenance, repair, and replacement.

Figure A2: Revenue Projections per Person and Job

Fiscal Year	Inter-governmental	Secondary Property Tax Levies	Privilege and Use Tax	Total
FY19-20	$262	$77	$283	$622
FY20-21	$273	$80	$269	$621
FY21-22	$269	$82	$281	$633
FY22-23	$281	$85	$290	$656
FY23-24	$283	$87	$299	$670

APPENDIX B: PROFESSIONAL SERVICES

As stated in Arizona's development fee enabling legislation, "a municipality may assess development fees to offset costs to the municipality associated with providing necessary public services to a development, including the costs of infrastructure, improvements, real property, engineering and architectural services, financing and professional services required for the preparation or revision of a development fee pursuant to this section, including the relevant portion of the infrastructure improvements plan" (see ARS § 9-463.05.A). Because development fees must be updated at least every five years, the cost of professional services is allocated to the projected increase in service units, over five years (see Figure B1). Qualified professionals must develop the IIP, using generally accepted engineering and planning practices. A qualified professional is defined as "a professional engineer, surveyor, financial analyst or planner providing services within the scope of the person's license, education or experience".

Figure B1: Cost of Professional Services

Necessary Public Service	Cost	Proportionate Share		Service Unit	5-Year Change	Cost per Service Unit
Fire	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Parks and Recreational	$23,370	Residential	89%	Population	13,250	$1.56
		Nonresidential	11%	Jobs	15,288	$0.17
Police	$20,000	Residential	54%	Population	13,250	$0.82
		Nonresidential	46%	Vehicle Trips	39,625	$0.23
Total	$63,370					

APPENDIX C: LAND USE DEFINITIONS

RESIDENTIAL DEVELOPMENT

As discussed below, residential development categories are based on data from the U.S. Census Bureau, American Community Survey. Development fees will be assessed to all new residential units. One-time development fees are determined by site capacity (i.e., number of residential units).

Single Family:

1. Single-family detached is a one-unit structure detached from any other house, that is, with open space on all four sides. Such structures are considered detached even if they have an adjoining shed or garage. A one-family house that contains a business is considered detached as long as the building has open space on all four sides.
2. Single-family attached (townhouse) is a one-unit structure that has one or more walls extending from ground to roof separating it from adjoining structures. In row houses (sometimes called townhouses), double houses, or houses attached to nonresidential structures, each house is a separate, attached structure if the dividing or common wall goes from ground to roof.
3. Mobile home includes both occupied and vacant mobile homes, to which no permanent rooms have been added. Mobile homes used only for business purposes or for extra sleeping space and mobile homes for sale on a dealer's lot, at the factory, or in storage are not counted in the housing inventory.

Multi-Family:

1. Includes units in structures containing two or more housing units, further categorized as units in structures with "2, 3 or 4, 5 to 9, 10 to 19, 20 to 49, and 50 or more apartments."
2. Includes any living quarters occupied as a housing unit that does not fit the other categories (e.g., houseboats, railroad cars, campers, and vans). Recreational vehicles, boats, vans, railroad cars, and the like are included only if they are occupied as a current place of residence.

NONRESIDENTIAL DEVELOPMENT

The proposed general nonresidential development categories (defined below) can be used for all new construction. Nonresidential development categories represent general groups of land uses that share similar average weekday vehicle trip generation rates and employment densities (i.e., jobs per thousand square feet of floor area).

Commercial: Establishments primarily selling merchandise, eating/drinking places, and entertainment uses. By way of example, commercial includes shopping centers, supermarkets, pharmacies, restaurants, bars, nightclubs, automobile dealerships, and movie theaters.

Industrial: Establishments primarily engaged in the production, transportation, or storage of goods. By way of example, industrial includes manufacturing plants, distribution warehouses, trucking companies, utility substations, power generation facilities, and telecommunications buildings.

Institutional: Public and quasi-public buildings providing educational, social assistance, or religious services. By way of example, institutional includes schools, universities, churches, daycare facilities, and government buildings.

Office and Other Services: Establishments providing management, administrative, professional, or business services; personal and health care services; and lodging facilities. By way of example, Office and Other services includes banks, business offices; hotels and motels; assisted-living facilities, nursing homes and hospitals.

APPENDIX D: LAND USE ASSUMPTIONS

Arizona's Development Fee Act requires the preparation of Land Use Assumptions, which are defined in Arizona Revised Statutes § 9-463.05(T)(6) as:

> *"projections of changes in land uses, densities, intensities and population for a specified service area over a period of at least ten years and pursuant to the General Plan of the municipality."*

The estimates and projections of residential and nonresidential development in this *Land Use Assumptions* document are for all areas within Tempe's city limits. The current demographic estimates and future development projections will be used in the Infrastructure Improvements Plan (IIP) and in the calculation of development fees. Current demographic data estimates for 2021 are used in calculating levels of service (LOS) provided to existing development in the City of Tempe. Arizona's Enabling Legislation requires fees to be updated at least every five years and limits the IIP to a maximum of 10 years.

SUMMARY OF GROWTH INDICATORS

Key land use assumptions for the City of Tempe Development Fee Report are population, housing units, employment, and nonresidential floor area projections. TischlerBise projects housing units using 2020 – 2040 projections published by the Maricopa Association of Governments (MAG). TischlerBise derives population estimates and projections by converting housing units to population using persons per housing unit factors. For nonresidential development, TischlerBise projects employment using 2020 – 2040 projections published by the Maricopa Association of Governments (MAG). Multiplying employment projections by employment density factors published by the Institute of Transportation Engineers (ITE) provides nonresidential floor area. The projections contained in this document provide the foundation for the Development Fee Report. These metrics are the service units and demand indicators used in the Development Fee Report.

Development projections summarized in Figure D14 are used to estimate development fee revenue and to indicate the anticipated need for growth-related infrastructure. Development fee methodologies are designed to reduce sensitivity to development projections in the determination of the proportionate share fee amounts. If actual development is slower than projected, fee revenue will decline, but so will the need for growth-related infrastructure. In contrast, if development is faster than anticipated, fee revenue will increase, but Tempe will also need to accelerate infrastructure improvements to keep pace with the actual rate of development.

During the next 10 years, residential development projections indicate a resident population increase of 24,798 persons in an additional 13,108 housing units, and nonresidential development projections indicate an employment increase of 30,603 jobs in approximately 14,937,000 square feet of floor area.

RESIDENTIAL DEVELOPMENT

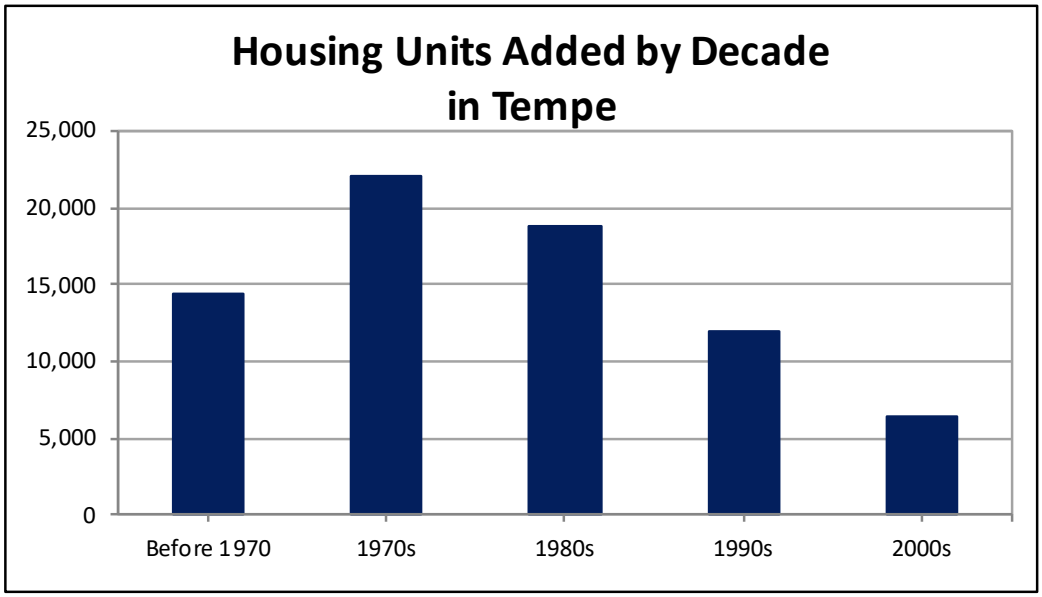
This section details current estimates and future projections of residential development.

Recent Residential Construction

Development fees require an analysis of current levels of service. For residential development, current levels of service are determined using estimates of population and housing units. Shown below, Figure D1 indicates the estimated number of housing units added by decade according to data obtained from the U.S. Census Bureau. In the previous decade, Tempe's housing stock grew by an average of 639 housing units per year.

Figure D1: Housing Units by Decade

Census 2000 Housing Units	67,068	Tempe's housing stock grew by an average of 639 housing units per year from 2000 to 2010.
Census 2010 Housing Units	73,462	
New Housing Units 2000 to 2010	6,394	



Source: U.S. Census Bureau, Census 2010 Summary File 1, Census 2000 Summary File 1, 2014-2018 5-Year American Community Survey (for 1990s and earlier, adjusted to yield total units in 2000).

As shown below, Tempe issued permits for approximately 1,488 housing units per year from Fiscal Year 2016 through Fiscal Year 2020. Multi-family units accounted for approximately 95 percent of permits.

Figure D2: Residential Building Permits

Fiscal Year	Single Family	Multi-Family	Total
2016	55	2,097	2,152
2017	69	1,038	1,107
2018	82	1,744	1,826
2019	74	673	747
2020	78	1,532	1,610
Average	72	1,417	1,488

Source: Tempe Community Development Department

Persons per Housing Unit

According to the U.S. Census Bureau, a household is a housing unit occupied by year-round residents. Development fees often use per capita standards and persons per housing unit (PPHU) or persons per household (PPH) to derive proportionate share fee amounts. When PPHU is used in the fee calculations, infrastructure standards are derived using year-round population. When PPH is used in the fee calculations, the development fee methodology assumes a higher percentage of housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. TischlerBise recommends that development fees for residential development in Tempe be imposed according to the number of persons per housing unit.

Occupancy calculations require data on population and the types of units by structure. The 2010 census did not obtain detailed information using a "long-form" questionnaire. Instead, the U.S. Census Bureau switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which has limitations due to sample-size constraints. For example, data on detached housing units are now combined with attached single units (commonly known as townhouses, which share a common sidewall, but are constructed on an individual parcel of land). For development fees in Tempe, detached units, attached units, and mobile home units are included in the "Single-Family" category. The "Multi-Family" category includes duplexes and all other structures with two or more units on an individual parcel of land.

Figure D3 below shows the occupancy estimates for Tempe based on 2014-2018 American Community Survey 5-Year Estimates. Single-family units averaged 2.50 persons per housing unit, and multi-family units averaged 1.86 persons per housing unit. The average occupancy for all housing units in Tempe was 2.19 persons per housing unit.

Figure D3: Persons per Housing Unit

Housing Type	Persons	Households	Persons per Household	Housing Units	Persons per Housing Unit	Housing Mix	Vacancy Rate
Single-Family[1]	103,078	38,432	2.68	41,191	**2.50**	52.1%	6.70%
Multi-Family[2]	70,339	32,549	2.16	37,815	**1.86**	47.9%	13.93%
Total	173,417	70,981	2.44	79,006	**2.19**	100.0%	10.16%

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates.

1. Includes detached, attached (i.e. townhouses), and mobile home units.
2. Includes dwellings in structures with two or more units.

Persons by Bedroom Range

Development fees must be proportionate to the demand for infrastructure. Because averages per housing unit have a strong, positive correlation to the number of bedrooms, TischlerBise recommends a fee schedule where larger units pay higher development fees. Benefits of the proposed methodology include 1) a proportionate assessment of infrastructure demand using local demographic data and 2) a progressive fee structure (i.e., smaller units pay less and larger units pay more).

Custom tabulations of demographic data by bedroom range can be created from individual survey responses provided by the U.S. Census Bureau in files known as Public Use Microdata Samples (PUMS). PUMS files are only available for areas of at least 100,000 persons, and the Tempe is located in two Public Use Microdata Areas (AZ PUMAs 00108 and 00109).

Shown in Figure D4, cells with yellow shading indicate the unweighted survey results, which yield the unadjusted estimate of 2.14 persons per housing unit. Unadjusted persons per housing unit estimates are adjusted to match the control total for Tempe – 2.19 persons per housing unit (see Figure D3). Adjusted persons per housing unit estimates range from 1.26 persons per housing unit for housing units with zero to one bedroom up to 2.80 persons per housing unit for housing units with four or more bedrooms.

Figure D4: Persons by Bedroom Range

Bedroom Range	Persons[1]	Housing Units[1]	Housing Mix	Unadjusted PPHU	Adjusted PPHU[2]
0-1	873	707	17%	1.23	1.26
2	1,996	1,041	25%	1.92	1.96
3	3,329	1,429	34%	2.33	2.38
4+	2,765	1,008	24%	2.74	2.80
Total	8,963	4,185	100%	2.14	2.19

1. American Community Survey, Public Use Microdata Sample for Arizona PUMAs 108 & 109 (2014-2018 ACS 5-Year unweighted data).

2. Adjusted multipliers are scaled to make the average PUMS values match control totals for Tempe based on 2014-2018 ACS 5-Year Estimates.

Persons by Square Feet of Living Area

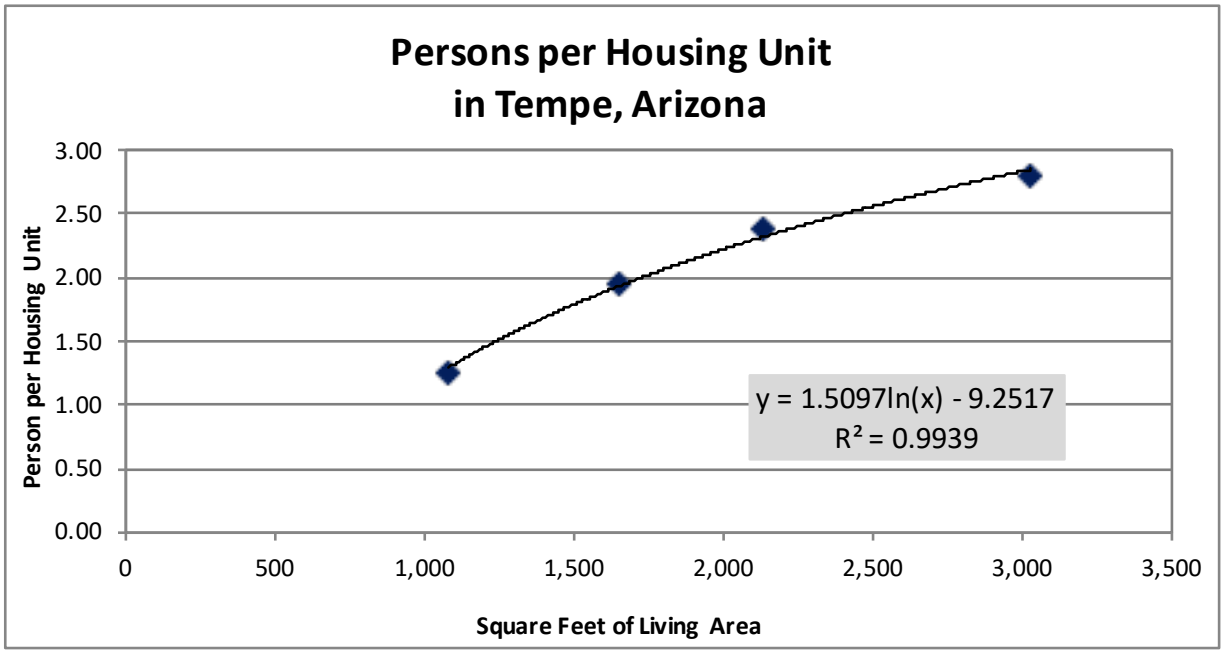
To estimate square feet of living area by bedroom range, TischlerBise uses 2018 U.S. Census Bureau data for housing units constructed in the Mountain West region. Based on 2018 estimates, living area ranges from 1,081 square feet for housing units with zero to one bedroom up to 3,029 square feet for housing units with four or more bedrooms.

Average square feet of living area and persons per housing unit by bedroom range are plotted in Figure D5 with a logarithmic trend line derived from U.S. Census Bureau estimates discussed in the previous paragraph and adjusted persons per housing unit estimates shown in Figure D4. Using the trend line formula shown in the figure, TischlerBise calculates the number of persons per housing unit, by living area, using intervals of 500 square feet. For the purpose of development fees, TischlerBise recommends a minimum development fee based on a unit size of 900 square feet and a maximum fee for units 1,901 square feet or more.

Figure D5: Persons by Square Feet of Living Area

Average persons per housing unit derived from 2014-2018 ACS PUMS data for Tempe. Unit size from the 2018 U.S. Census Bureau average for units constructed in the Census Mountain West region.

Average per Housing Unit			Fitted-Curve Values	
Bedrooms	Square Feet	PPHU	Sq Ft Range	PPHU
0-1	1,081	1.26	900 or less	1.02
2	1,655	1.96	901 to 1,400	1.68
3	2,131	2.38	1,401 to 1,900	2.15
4+	3,029	2.80	1,901 or more	2.50



Residential Estimates

Based on data published by the Maricopa Association of Governments (MAG), the 2020 housing unit estimate includes 83,615 housing units. To estimate housing units in the 2021 base year, TischlerBise uses a linear formula to allocate housing units based on MAG's 2020 and 2025 housing unit projections. Based on these projections, the 2021 base year includes 85,043 housing units.

To estimate population, the analysis applies the occupancy factors shown in Figure D3 to the housing unit estimates shown in Figure D6. For example, converting 138 single-family housing units built between 2020 and 2021 (42,663 single-family housing units – 42,526 single-family housing units) results in an additional 345 persons in single-family housing units (138 single-family units X 2.50 persons per housing unit). Adding this to the 2020 single-family population of 106,374 persons results in a 2021 population of 106,718 persons in single-family housing units. The 2021 base year population equals 191,033 persons.

Figure D6: Residential Estimates

Tempe, Arizona	2020	2021
Population		
Single Family	106,374	106,718
Multi-Family	81,915	84,314
Total	**188,289**	**191,033**
Housing Units		
Single Family	42,526	42,663
Multi-Family	41,089	42,379
Total	**83,615**	**85,043**

Source: Maricopa Association of Governments

Residential Projections

Based on 2020 – 2040 MAG projections, Tempe can expect 13,108 additional housing units over the next 10 years – 651 single-family units and 12,457 multi-family units. For housing units, the projected average annual increase (65 single-family units and 1,246 multi-family units) is similar to recent building permit trends shown in Figure D2 (72 single-family units per year and 1,471 multi-family units per year). For this study, the analysis assumes the occupancy factors shown in Figure D3 will remain constant. Converting projected housing units to population, as discussed above, results in a 10-year population increase of 24,798 persons.

Figure D7: Residential Development Projections

Tempe, Arizona	2021	2022	2023	2024	2025	2026	2031	10-Year
	Base	1	2	3	4	5	10	Increase
Population								
Single Family	106,718	107,063	107,408	107,752	108,097	108,145	108,347	1,628
Multi-Family	84,314	86,714	89,113	91,513	93,912	96,138	107,484	23,170
Total	**191,033**	**193,777**	**196,521**	**199,265**	**202,009**	**204,283**	**215,831**	**24,798**
Housing Units								
Single Family	42,663	42,801	42,939	43,077	43,215	43,234	43,315	651
Multi-Family	42,379	43,669	44,959	46,249	47,539	48,736	54,836	12,457
Total	**85,043**	**86,471**	**87,898**	**89,326**	**90,754**	**91,970**	**98,151**	**13,108**

NONRESIDENTIAL DEVELOPMENT

This section details current estimates and future projections of nonresidential development including jobs and nonresidential floor area.

Nonresidential Square Footage Estimates

TischlerBise uses the term jobs to refer to employment by place of work. In Figure D8, gray shading indicates the nonresidential development prototypes used by TischlerBise to derive employment densities and average weekday vehicle trip ends. For nonresidential development, TischlerBise uses data published in Trip Generation, Institute of Transportation Engineers, 10th Edition (2017). The prototype for industrial development is Light Industrial (ITE 110) which has 615 square feet of floor area per employee. Institutional development uses Elementary School (ITE 520) and has 1,076 square feet of floor area per employee. For office and other services development, the proxy is General Office (ITE 710); it has 337 square feet of floor area per employee. The prototype for commercial development is Shopping Center (ITE 820) which has 427 square feet of floor area per employee.

Figure D8: Nonresidential Demand Units

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit[1]	Wkdy Trip Ends Per Employee[1]	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	4.96	3.05	1.63	615
130	Industrial Park	1,000 Sq Ft	3.37	2.91	1.16	864
140	Manufacturing	1,000 Sq Ft	3.93	2.47	1.59	628
150	Warehousing	1,000 Sq Ft	1.74	5.05	0.34	2,902
254	Assisted Living	bed	2.60	4.24	0.61	na
310	Hotel	room	8.36	14.34	0.58	na
520	Elementary School	1,000 Sq Ft	19.52	21.00	0.93	1,076
530	High School	1,000 Sq Ft	14.07	22.25	0.63	1,581
540	Community College	student	1.15	14.61	0.08	na
550	University/College	student	1.56	8.89	0.18	na
565	Day Care	student	4.09	21.38	0.19	na
610	Hospital	1,000 Sq Ft	10.72	3.79	2.83	354
620	Nursing Home	bed	3.06	2.91	1.05	na
710	General Office (average size)	1,000 Sq Ft	9.74	3.28	2.97	337
715	Single Tenant Office	1,000 Sq Ft	11.25	3.77	2.98	335
730	Government Office	1,000 Sq Ft	22.59	7.45	3.03	330
750	Office Park	1,000 Sq Ft	11.07	3.54	3.13	320
820	Shopping Center (average size)	1,000 Sq Ft	37.75	16.11	2.34	427

1. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).

Nonresidential Estimates

Based on data published by the Maricopa Association of Governments (MAG), the 2020 employment estimate includes 200,506 jobs. To estimate employment in the 2021 base year, TischlerBise uses a linear formula to allocate employment based on MAG's 2020 and 2025 employment projections. Based on this allocation, the 2021 base year includes 203,555 jobs.

To estimate nonresidential floor area, the analysis applies the square feet per employee factors shown in Figure D8 to the employment estimates shown in Figure D9. For example, 47,489 industrial jobs in 2021 multiplied by 615 square feet per employee equals approximately 29,205,858 square feet of industrial development in 2021. Nonresidential floor area in the 2021 base year equals approximately 95,213,451 square feet.

Figure D9: Nonresidential Estimates

Nonresidential Category	2020 Jobs[1]	Percent of Total Jobs	Square Feet per Job[2]	2020 Estimated Floor Area[3]	Jobs per 1,000 Sq. Ft.[2]
Industrial	46,879	23%	615	28,830,585	1.63
Commercial	32,399	16%	427	13,834,373	2.34
Office & Other Services	107,377	54%	337	36,186,049	2.97
Institutional	13,851	7%	1,076	14,901,178	0.93
Total	200,506	100%		93,752,185	

1. TischlerBise calculation based on Marciopa Association of Governments, 2020 estimates.
2. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).
3. TischlerBise calculation (2020 jobs X ITE factors).

Nonresidential Category	2021 Jobs[1]	Percent of Total Jobs	Square Feet per Job[2]	2021 Estimated Floor Area[3]	Jobs per 1,000 Sq. Ft.[2]
Industrial	47,489	23%	615	29,205,858	1.63
Commercial	32,741	16%	427	13,980,492	2.34
Office & Other Services	109,158	54%	337	36,786,179	2.97
Institutional	14,167	7%	1,076	15,240,922	0.93
Total	203,555	100%		95,213,451	

1. TischlerBise calculation based on Marciopa Association of Governments, 2020-2025 projections.
2. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).
3. TischlerBise calculation (2021 jobs X ITE factors).

Nonresidential Projections

Based on 2020 – 2040 MAG projections, Tempe can expect 30,603 additional jobs over the next 10 years. Converting projected employment to nonresidential floor area, as discussed on the previous page, results in a 10-year increase of 14,937,000 square feet. The projected average annual increase of 1,494,000 square feet per year is similar to the average annual increase of 1,484,000 square feet per year based on Fiscal Year 2016 through Fiscal Year 2020 building permit data provided by Tempe's Community Development Department.

Employment and floor area projections are used to illustrate the possible future pace of service demands, revenues, and expenditures. To the extent these factors change, the projected need for infrastructure will also change. If development occurs at a more rapid rate than projected, the demand for infrastructure will increase at a corresponding rate. If development occurs at a slower rate than projected, the demand for infrastructure will also decrease.

Figure D10: Nonresidential Development Projections

Tempe, Arizona	2021	2022	2023	2024	2025	2026	2031	10-Year
	Base	1	2	3	4	5	10	Increase
Employment								
Industrial	47,489	48,099	48,710	49,320	49,930	50,418	52,655	5,165
Commercial	32,741	33,083	33,426	33,768	34,110	34,329	35,316	2,575
Office & Other Services	109,158	110,939	112,719	114,500	116,281	118,222	128,020	18,862
Institutional	14,167	14,483	14,798	15,114	15,430	15,875	18,167	4,001
Total	**203,555**	**206,604**	**209,653**	**212,702**	**215,751**	**218,843**	**234,158**	**30,603**
Nonres. Sq Ft (x1,000)								
Industrial	29,206	29,581	29,956	30,332	30,707	31,007	32,383	3,177
Commercial	13,980	14,127	14,273	14,419	14,565	14,658	15,080	1,099
Office & Other Services	36,786	37,386	37,986	38,587	39,187	39,841	43,143	6,357
Institutional	15,241	15,581	15,920	16,260	16,600	17,079	19,545	4,304
Total	**95,213**	**96,675**	**98,136**	**99,597**	**101,059**	**102,585**	**110,150**	**14,937**

AVERAGE WEEKDAY VEHICLE TRIPS

Tempe will use average weekday vehicle trips (AWVT) as the nonresidential demand units for Fire Facilities fees and Police Facilities fees. Components used to calculate AWVT include average weekday vehicle trip ends published by the Institute of Transportation Engineers, trip rate adjustments, and adjustments for pass-by trips.

Trip Generation Rates

This analysis uses trip generation rates published in Trip Generation, Institute of Transportation Engineers, 10th Edition (2017). Shown below, Figure D11 includes the nonresidential development prototypes used by TischlerBise to derive average weekday vehicle trips. The prototype for industrial development is Light Industrial (ITE 110) which generates 4.96 average weekday vehicle trip ends per 1,000 square feet of floor area. Institutional development uses Elementary School (ITE 520) and generates 19.52 average weekday vehicle trip ends per 1,000 square feet of floor area. For office and other services development, the proxy is General Office (ITE 710); it generates 9.74 average weekday vehicle trip ends per 1,000 square feet of floor area. The prototype for commercial development is Shopping Center (ITE 820) which generates 37.75 average weekday vehicle trips per 1,000 square feet of floor area.

Figure D11: Nonresidential Demand Units

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit[1]	Wkdy Trip Ends Per Employee[1]	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	4.96	3.05	1.63	615
520	Elementary School	1,000 Sq Ft	19.52	21.00	0.93	1,076
710	General Office (average size)	1,000 Sq Ft	9.74	3.28	2.97	337
820	Shopping Center (average size)	1,000 Sq Ft	37.75	16.11	2.34	427

1. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).

Trip Rate Adjustments

A trip end represents a vehicle or person entering or exiting a development (as if a traffic counter were placed across a driveway). Adjustment factors must be used when calculating trips in order to avoid double counting each trip, both at the origin and the destination. The basic trip adjustment factor is 50 percent. As discussed further below, the development fee methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

Adjustment for Pass-By Trips

For nonresidential development, the basic trip adjustment factor of 50 percent is applied to industrial and office land uses. The commercial and institutional categories have a trip factor of less than 50 percent because these types of development attract vehicles as they pass by on arterial and collector roads. For example, for an average size shopping center, the ITE (2017) indicates that on average 34 percent of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66 percent of attraction trips have the shopping center as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor (0.66 x 0.50 = 0.33) is approximately 33 percent of the trip ends.

Nonresidential Demand Indicators – Average Weekday Vehicle Trips

Shown in Figure D12 are the demand indicators for nonresidential land uses related to average weekday vehicle trips (AWVT). The table displays AWVT generated per 1,000 square feet of floor area.

Figure D12: Nonresidential Demand Indicators, Average Weekday Vehicle Trips (AWVT)

Nonresidential Development			
Development Type	AWVTE per 1,000 Sq Ft[1]	Trip Rate Adjustment	AWVT per 1,000 Sq Ft[1]
Industrial	4.96	50%	2.48
Commercial	37.75	33%	12.46
Office & Other Services	9.74	50%	4.87
Institutional	19.52	33%	6.44

1. See Land Use Assumptions

Nonresidential Vehicle Trips

Shown below, Figure D13 details the calculations used to estimate nonresidential vehicle trips generated by Tempe's existing nonresidential development. Based on this analysis, Tempe's existing nonresidential development generates an average of 523,917 vehicle trips on a typical weekday. Here's an example of the calculation for industrial development: 4.96 average weekday vehicle trips ends per 1,000 square feet of floor area (KSF) X 50 percent trip adjustment factor X 29,206 KSF of industrial floor area = 72,431 average vehicle trips per day from industrial development. The same calculation is performed for each development type.

Figure D13: Nonresidential Vehicle Trips, 2021

Development Type	Development Unit	ITE Code	Avg Wkday VTE	Trip Adjustment	2021 Dev Units	2021 Veh Trips
Industrial	KSF	110	4.96	50%	29,206	72,431
Commercial	KSF	820	37.75	33%	13,980	174,162
Office & Other Services	KSF	710	9.74	50%	36,786	179,149
Institutional	KSF	520	19.52	33%	15,241	98,176
Total						523,917

DEVELOPMENT PROJECTIONS

Provided below is a summary of development projections. Development projections are used to illustrate a possible future pace of demand for service units and cash flows resulting from revenues and expenditures associated with those demands.

Figure D14: Development Projections Summary

Tempe, Arizona	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10-Year
	Base	1	2	3	4	5	6	7	8	9	10	Increase
Population												
Single Family	106,718	107,063	107,408	107,752	108,097	108,145	108,193	108,241	108,290	108,338	108,347	1,628
Multi-Family	84,314	86,714	89,113	91,513	93,912	96,138	98,364	100,589	102,815	105,041	107,484	23,170
Total	**191,033**	**193,777**	**196,521**	**199,265**	**202,009**	**204,283**	**206,557**	**208,831**	**211,105**	**213,379**	**215,831**	**24,798**
Housing Units												
Single Family	42,663	42,801	42,939	43,077	43,215	43,234	43,253	43,273	43,292	43,311	43,315	651
Multi-Family	42,379	43,669	44,959	46,249	47,539	48,736	49,933	51,129	52,326	53,523	54,836	12,457
Total	**85,043**	**86,471**	**87,898**	**89,326**	**90,754**	**91,970**	**93,186**	**94,402**	**95,618**	**96,834**	**98,151**	**13,108**
Employment												
Industrial	47,489	48,099	48,710	49,320	49,930	50,418	50,905	51,393	51,880	52,368	52,655	5,165
Commercial	32,741	33,083	33,426	33,768	34,110	34,329	34,547	34,766	34,984	35,203	35,316	2,575
Office & Other Services	109,158	110,939	112,719	114,500	116,281	118,222	120,162	122,103	124,043	125,984	128,020	18,862
Institutional	14,167	14,483	14,798	15,114	15,430	15,875	16,320	16,766	17,211	17,656	18,167	4,001
Total	**203,555**	**206,604**	**209,653**	**212,702**	**215,751**	**218,843**	**221,935**	**225,027**	**228,119**	**231,211**	**234,158**	**30,603**
Nonres. Sq Ft (x1,000)												
Industrial	29,206	29,581	29,956	30,332	30,707	31,007	31,307	31,607	31,906	32,206	32,383	3,177
Commercial	13,980	14,127	14,273	14,419	14,565	14,658	14,752	14,845	14,938	15,032	15,080	1,099
Office & Other Services	36,786	37,386	37,986	38,587	39,187	39,841	40,495	41,149	41,803	42,457	43,143	6,357
Institutional	15,241	15,581	15,920	16,260	16,600	17,079	17,558	18,037	18,516	18,995	19,545	4,304
Total	**95,213**	**96,675**	**98,136**	**99,597**	**101,059**	**102,585**	**104,111**	**105,637**	**107,163**	**108,689**	**110,150**	**14,937**

Tempe, Arizona	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	20-Year
	11	12	13	14	15	16	17	18	19	20	Increase
Population											
Single Family	108,355	108,364	108,373	108,382	108,394	108,407	108,419	108,432	108,444	108,457	1,738
Multi-Family	109,927	112,371	114,814	117,257	118,890	120,524	122,157	123,791	125,424	127,057	42,743
Total	**218,283**	**220,735**	**223,187**	**225,638**	**227,284**	**228,930**	**230,576**	**232,222**	**233,868**	**235,514**	**44,481**
Housing Units											
Single Family	43,318	43,322	43,325	43,329	43,334	43,339	43,344	43,349	43,354	43,359	695
Multi-Family	56,150	57,463	58,777	60,090	60,969	61,847	62,725	63,603	64,481	65,360	22,980
Total	**99,468**	**100,785**	**102,102**	**103,419**	**104,302**	**105,185**	**106,069**	**106,952**	**107,835**	**108,718**	**23,675**
Employment											
Industrial	52,941	53,228	53,514	53,801	53,927	54,054	54,180	54,307	54,433	54,559	7,070
Commercial	35,429	35,542	35,655	35,768	35,828	35,889	35,949	36,010	36,070	36,130	3,389
Office & Other Services	130,056	132,092	134,128	136,164	137,870	139,577	141,283	142,990	144,696	146,402	37,245
Institutional	18,679	19,190	19,702	20,213	20,675	21,136	21,598	22,059	22,521	22,983	8,816
Total	**237,105**	**240,052**	**242,999**	**245,946**	**248,301**	**250,656**	**253,010**	**255,365**	**257,720**	**260,075**	**56,520**
Nonres. Sq Ft (x1,000)											
Industrial	32,559	32,735	32,911	33,088	33,165	33,243	33,321	33,399	33,476	33,554	4,348
Commercial	15,128	15,176	15,225	15,273	15,299	15,325	15,350	15,376	15,402	15,428	1,447
Office & Other Services	43,829	44,515	45,201	45,887	46,462	47,037	47,612	48,187	48,763	49,338	12,551
Institutional	20,095	20,645	21,195	21,746	22,242	22,739	23,235	23,732	24,229	24,725	9,484
Total	**111,611**	**113,072**	**114,533**	**115,993**	**117,169**	**118,344**	**119,519**	**120,694**	**121,869**	**123,044**	**27,831**

Provided below is a summary of nonresidential vehicle trip projections. These projections are used to illustrate a possible future pace of demand for service units and cash flows resulting from revenues and expenditures associated with those demands.

Figure D15: Nonresidential Vehicle Trip Projections Summary

Development Type	Development Unit	ITE Code	Avg Wkday VTE	Trip Adjustment	2021 Dev Units	2021 Veh Trips
Industrial	KSF	110	4.96	50%	29,206	72,431
Commercial	KSF	820	37.75	33%	13,980	174,162
Office & Other Services	KSF	710	9.74	50%	36,786	179,149
Institutional	KSF	520	19.52	33%	15,241	98,176
Total						523,917

Tempe, Arizona	Base	1	2	3	4	5	6	7	8	9	10	10-Year Increase
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
Industrial KSF	29,206	29,581	29,956	30,332	30,707	31,007	31,307	31,607	31,906	32,206	32,383	3,177
Commercial KSF	13,980	14,127	14,273	14,419	14,565	14,658	14,752	14,845	14,938	15,032	15,080	1,099
Office & Other Services KSF	36,786	37,386	37,986	38,587	39,187	39,841	40,495	41,149	41,803	42,457	43,143	6,357
Institutional KSF	15,241	15,581	15,920	16,260	16,600	17,079	17,558	18,037	18,516	18,995	19,545	4,304
Industrial Trips	72,431	73,361	74,292	75,223	76,153	76,897	77,641	78,384	79,128	79,872	80,309	7,878
Commercial Trips	174,162	175,982	177,803	179,623	181,443	182,606	183,769	184,932	186,094	187,257	187,858	13,696
Office & Other Services Trips	179,149	182,071	184,994	187,917	190,839	194,024	197,209	200,394	203,579	206,764	210,105	30,956
Institutional Trips	98,176	100,364	102,553	104,741	106,930	110,015	113,100	116,186	119,271	122,356	125,900	27,724
Nonresidential Trips	523,917	531,779	539,641	547,503	555,365	563,542	571,719	579,895	588,072	596,249	604,172	80,255

Tempe, Arizona	11	12	13	14	15	16	17	18	19	20	20-Year Increase
	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
Industrial KSF	32,559	32,735	32,911	33,088	33,165	33,243	33,321	33,399	33,476	33,554	4,348
Commercial KSF	15,128	15,176	15,225	15,273	15,299	15,325	15,350	15,376	15,402	15,428	1,447
Office & Other Services KSF	43,829	44,515	45,201	45,887	46,462	47,037	47,612	48,187	48,763	49,338	12,551
Institutional KSF	20,095	20,645	21,195	21,746	22,242	22,739	23,235	23,732	24,229	24,725	9,484
Industrial Trips	80,746	81,183	81,620	82,057	82,250	82,443	82,636	82,828	83,021	83,214	10,783
Commercial Trips	188,459	189,060	189,662	190,263	190,584	190,905	191,226	191,548	191,869	192,190	18,028
Office & Other Services Trips	213,447	216,788	220,130	223,471	226,272	229,072	231,873	234,673	237,474	240,274	61,125
Institutional Trips	129,444	132,988	136,532	140,076	143,275	146,474	149,673	152,872	156,071	159,269	61,093
Nonresidential Trips	612,096	620,020	627,943	635,867	642,380	648,894	655,407	661,921	668,434	674,948	151,031